

# Determining the rational entry mode for international construction projects

: Case Study of super long-span bridges

[Giwon Yu, Woosik Jang, Jung Ki Lee, Seung Heon Han]

**Abstract**— The international construction market is rapidly expanding again following the financial crises in Europe and the US, providing more opportunities for international construction firms to increase revenues from overseas projects. To advantage of these circumstances, most contractors seek opportunities to enter the growing overseas markets, particularly into the sector of infrastructure projects including high-speed railway and super long-span bridge. In the pursuit of this entry, these contractors must strategically decide which entry mode to use for a targeted market or project. In the present study, the entry mode for international projects is examined based on the following two questions: "Which factors should be considered to determine the entry mode?" and "How do these factors influence the entry mode?" To address these questions that are specifically tailored for super long-span bridge projects, "The five elements of strategy" are applied to develop a framework for contractors to use when the firm selects an entry mode for a targeted international project. To verify the suggested framework in terms of its practical applicability, four case studies and an in-depth case study are performed on a super long-span bridge project. The results showed that the proposed and actual entry modes are almost coinciding, validating the proposed framework. The framework presented here is expected to help contractors identify the optimal strategy for proposing international projects in this rapidly increasing market.

**Keywords**—International Construction, Super long-span bridge, entry mode, framework

## I. Introduction

The international construction market is rapidly expanding following the financial crises in Europe and the US, providing opportunities for international construction firms to increase revenues from overseas projects. According to ENR (2004; 2013), the top 250 international construction firms earned a combined revenue of 139.8 billion US dollars in 2003, a figure that increased greatly to 507.5 billion US dollars in 2012. Recent trends for national-wide development in Asian countries indicate that the international construction market will continue to increase (Ling, 2008).

As a result, most contractors are seeking opportunities to enter overseas markets. To achieve this aim, contractors must strategically decide a construction company's approach to proposing a development project to use for a targeted market or project (Agarwal & Ramaswami, 1992).

Additionally, to survive and grow during this time of growing opportunities as well as intensifying risks, international contractors must utilize the most appropriate entry modes for targeted overseas markets (Chen, 2008). To overcome the risks associated with entering the international construction markets, strategies suited to specific projects must be considered to ensure the most appropriate entry mode. Determining the most appropriate entry mode for each situation ultimately can lead to project success (Mohamed, 2003).

In the literature of previous study under this subject, the appropriate entry mode for international projects is considered based on the following two questions: 'Which factors are to be considered for determining the entry mode?' and 'How do the factors influence the entry mode?' To address these questions, Chen (2011) proposed that an international contractor should consider five strategic effects: risk exposure, return, control, resource commitment, and flexibility. However, the proposed model is only applicable to contractors who have already selected a target country and not to contractors who selected a specific project. Accordingly, international contractors need to determine the flexible model depending on project order.

To address these issues, this paper developed a framework to help determine the appropriate entry mode for international construction projects, focusing on a specific long-span bridge.

## II. Entry Mode selection model

### A. Decision-making framework

The business strategy is an integrated and overarching concept that proposes how a business will achieve its objectives. This includes "The five elements of strategy," which are arenas, differentiators, vehicles, staging, and economic logic (Hambrick and Fredrickson, 2001). These elements help construction contractors to make reasonable decisions in a changing and dynamic market and can serve as a template for the strategy used to expand into other countries (Choi, 2012). "The five elements of strategy" are applied to develop a framework for contractors to decide when and which entry mode is best fit to employ for an international construction project.

The arena element is used to address the question, "where will we be active?", which judges a contractor's external environment (e.g., market segment and market condition). From an international construction industry perspective, the arena represents the environment of the country to which a contractor intends to introduce a product. Thus, for a

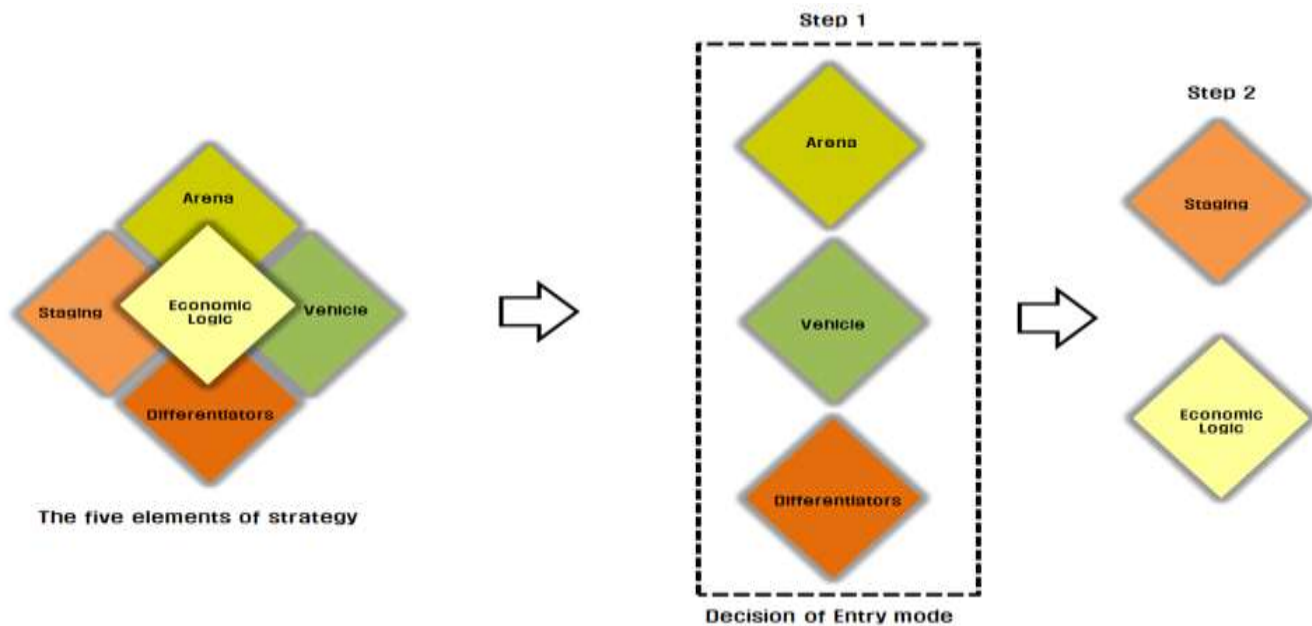


Figure 1. Assessment Factors

contractor that specializes in the long-span bridge sector and aims to enter into overseas business, the contractor will investigate countries in which project delivery is anticipated. Among these countries, the arena is composed of the target markets under consideration by the contractor.

The differentiator element is defined as a contractor's internal core competence, e.g., the area in which the contractor has superior resources and competitive advantages when compared to other contractors in the external environment. In the growing global market, the differentiator element has become an important factor associated with profitable overseas projects.

The vehicle element represents a method for approaching the arena as a sequence prior to the differentiator element; however, the present research redefines the vehicle as being subsequent to the differentiator, and the application of this element is limited because the main study objective of this research is the determination of the appropriate entry mode. Staging is a strategic progress sequence based on arena, differentiator, and vehicle. This paper suggests that staging must respond to changes in the arena and should reflect the contractor's internal competence. Economic logic is the detailed methodology used by a contractor to determine the optimal entry mode to ensure a profit and achieve other business objectives. As shown in figure 1, the proposed framework is developed from a construction industry perspective and is based on a specific project. Arena, vehicle, and differentiator serve as the components of the proposed strategy (Hambrick and Fredrickson, 2005). A contractor must consider the selected arena, the differentiator element, and intended entry mode simultaneously in step 1. In step 2, the contractor determines the staging strategy and profit goals. Of the 5 elements, economic logic and staging are the final goals of the present research, whereas arena, differentiator, and vehicle are mainly used to derive external and internal factors.

To enable an in-depth analysis of the five elements in view of the construction industry, internal and external factors that influence project performance are matched with the five elements. Internal factors are used to deduce the strengths and the weaknesses of a contractor's capability, resulting in a successful project outcome (Zhang, 2008). The internal factors include two parts, technical and management competence (Gunhan, 2005), with which practitioners can assess their internal capability, which are important in engineering, procurement, and construction (EPC) stages. Entry experience describes a contractor's past performance in a country and can be used to indirectly estimate the anticipated profit. International project risks are classified according to their causes and are divided into external and internal aspects (Zhi, 1995); however, risks are classified as differentiator and are differentiated according to the effectiveness of risk management (Han, 2002).

External factors represent opportunities or threats that are imposed on a contractor and must be viewed differently in domestic and overseas environments. Various researchers describe the external environment as a factor that affects project success (Kaming, 1997; Songer & Molenaar 1997; Chuna, 1999). External factors include economic, social, technological, and political factors affecting the construction process (Akinsola, 1997; Albert, 2004). Based on previous research, to analyze whether an environment offers a project opportunity or threat to a contractor, this study selected three aspects to be assessed: market opportunity, business environment. Market opportunity represents the growth rate and competition intensity among a country's companies that are aiming to enter the market. Business environment denotes the political governance and ease of conducting business.

As shown in Table 1, using the internal capability level and external environment results, the six indices are derived based on country assessment, project risk, and contractor capability

and replaced depending on the characteristics as arena and differentiator.

Table 1. Assessment Factors

Project	Host Country	Characteristic
Arena	Market Opportunity	External
	Business environment	External
	Entry experience	Internal
Differentiator	Technical capability	Internal
	Management capability	Internal
	Project risk	Internal and External

**B. Entry mode for international contractors**

As a firm expands into overseas projects, both external and internal factors directly relate to the performance of the firm as the project is completed. Therefore, the positioning of both factors is crucial for determining the optimal entry mode. Chen et al (2009) identified ten different entry modes (strategic alliance, local agent, licensing, joint venture company, sole venture company, branch office, representative

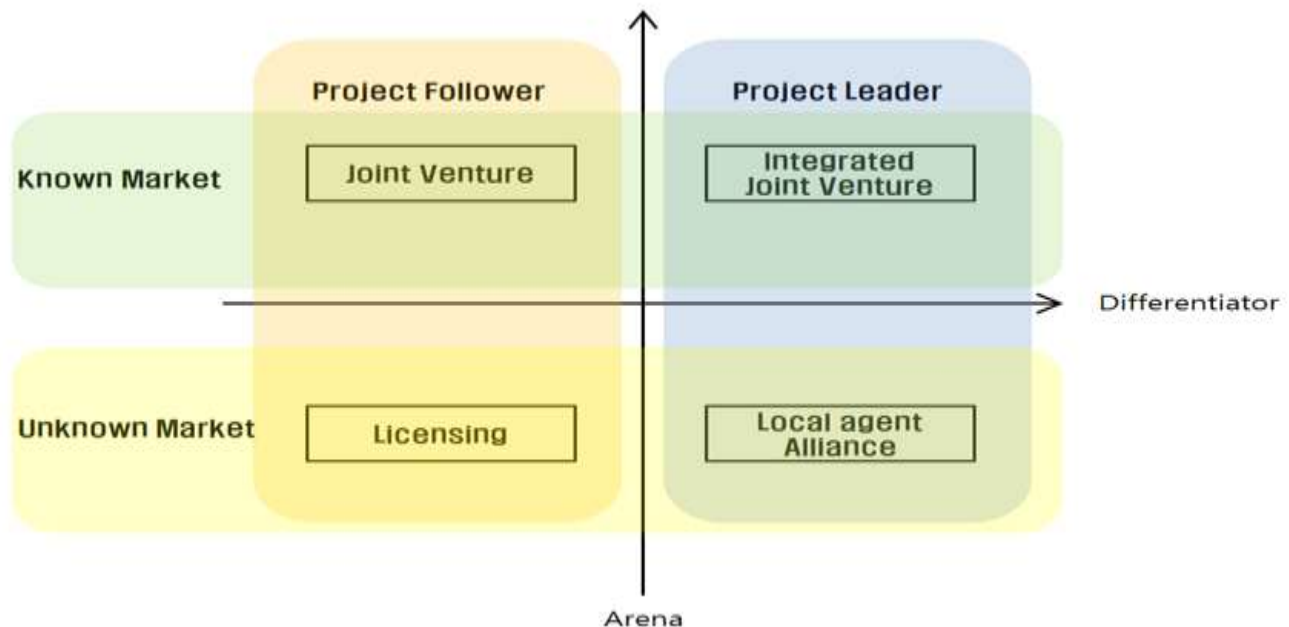
the model for the project-type entry mode. Strategic alliance, branch office, and representative office entry modes are exempted from the model; these entry modes are used by firms when a firm intends to remain in the market for a long period of time. Venture companies and venture projects are used when a new company is established to carry out the project in the market, combining two entry mode types into a “joint venture” entry mode. The other entry modes, sole venture company and sole venture project, are combined into an “integrated joint venture” entry mode. The local agent mode is used when the entry duration is medium to long term; the main objective of this entry mode is to accumulate information and data on a target market. In the developed model, this entry mode is altered to “local agent alliance.”

**III. Evaluation of the Proposed Framework**

**A. Evaluation of the proposed framework**

To evaluate the suggested framework in terms of its practical application, a super long-span bridge project was examined. The main span of the cable-stayed bridge was 1000 m, similar to that of the Sutong Bridge (1,088 m, China) and Stonecutters Bridge (1018 m, Hong Kong) (Wang, 2010). The market size for super long-span bridges is expected to grow to more than 47 billion US dollars, and the size of each project is enormous

Figure 2. Entry mode decision Matrix



office, joint venture project, sole venture project, and BOT/equity project), which the present research uses to develop an entry mode model.

In this research, the entry mode selection focuses on the project type rather than the country a firm is considering entering. Therefore, the ten entry modes are categorized to fit

when compared to other project types (Mun, 2008). Additionally, due to the difficulty in designing and constructing a super long-span bridge, high technical capabilities are required to successfully conduct the project overseas (Ostenfeld, 1992; Yamaguchi, 1995; Fujino, 2002). The actual project and developed framework assessment result

were compared to validate the framework. Due to the difficulty in accumulating data on super long-span bridges, experts with more than 5 years of experience were interviewed for 4 different project types.

Project A is a long-span bridge of 607 m in Brunei. The firm conducting this project had more than 30 years of experience in overseas projects. The assessment of the framework resulted in an internal element of 69 points, which is satisfactory, and an external element of 51 points, which is on the average level. An expert assessed as satisfactory the internal capabilities with which this firm has conducted numerous bridge construction projects over the years. Additionally, the project environment (Brunei) had a satisfactory market entry opportunity and average project environment and project experience. The developed framework resulted in an integrated joint venture entry mode, which was the entry mode actually employed by the firm in this real project.

Project B is a cable-stayed bridge with a 6-km span, and project C is a suspension bridge with a 3.4-km span. Both projects were assessed by engineering firm experts. The experts gave the contracted firms' a high score for technical capabilities but a low score for management capabilities (27 and 23 points, respectively). Additionally, the external elements, market entry opportunity, project environment, and project experience received a lower than average score. The framework results thus proposed the licensing entry mode. The actual entry mode selected by the firm was, in fact, a licensing entry mode. These two projects are currently realizing a stable profit.

Table 2. Evaluation of Framework

Project	Host Country	Differentiator	Arena	Entry Mode	Actual Entry Mode
A	Brunei	69	51	Integrated Venture	Same
B	U.A.E	27	42	Licensing	Same
C	Algeria	23	44	Licensing	Same
D	Brunei	17	57	Joint Venture	-

Project D is a 30-km long-span bridge that crosses the sea and will soon to be bid upon. The assessed expert's firm has specialized in road and bridge design projects. The internal and technical capability assessments were high. However, because the firm is an engineering firm, the construction capability was low, receiving only 17 points. However, the host country assessment was satisfactory because the firm had experience with the host country. As a result, our framework proposed a joint venture project entry mode. The firm is currently in the process of constructing a consortium with a leading construction firm; thus, the actual entry mode of this project is likely to be a joint venture.

The framework evaluation is shown in table 2, where the Differentiator and Arena, proposed entry mode, and actual entry mode are listed. The results of the framework and actual

entry mode correspond with each other, validating the framework development. As the Differentiator assessment is low, entry modes such as joint venture are used to complement the lacking capabilities. Additionally, as the Arena assessment is low, entry modes such as local alliance and licensing are used to change the risks to opportunities.

## B. In-depth case study

To further test the proposed framework, an in-depth case study was additionally performed on a super long-span bridge project in Turkey. The assessment respondent of the framework is an expert with the Korea Highway Corporation. The framework was assessed from the perspective of one of the top ten international construction companies in Korea. The entry mode deduced by framework was compared and analyzed with the actual entry mode of the firm through relevant official data. This project consisted of a consortium of private firms and a total road construction length of 115 km. The contract type for the super long-span bridge was EPC.

With a total bridge length of 2,164 m, this is the first cable-stayed suspension hybrid bridge to be constructed in Turkey. The central span length is more than 1,000 m, which requires the firms to have high risk management and construction skills, as the project is built using a fast-track technique. To assess this framework, the differentiator was highly evaluated at 88 points, with a project risk of 47 points, indicating that the project is highly risky due to its high level of construction difficulty and challenging project management sector. The Arena scored 87 points, demonstrating a positive evaluation result in all sectors (i.e., market opportunity, business environment, and entry experience). As a result, the proposed entry mode for Korean contractors was deduced as joint venture arising from an internal element of 47 points and an external element of 87 points.

To validate the assessment results of the respondent, the actual entry mode that the contractors selected based on the country's condition was compared with the framework's recommendation. As transportation infrastructure sector investment expands in Turkey, the average annual growth rate is expected to increase by 9.2% from 2012 to 2022 (Global insight, 2013), and fewer international construction firms are present (17 companies) when compared to other countries (ENR, 2013). Turkey's political governance is ranked in the top 45% worldwide, and the ease of conducting business in Turkey is in the top 18% (World Bank, 2012).

After analyzing the objective data, the external element offers an opportunity rather than a risk to firms. Comparing the two contractors that have participated in the project, company A has generated a revenue of 34,096 million US dollars, and company B has generated a revenue of 13,595 million US dollars, ranked 1st and 10th, respectively, among the top 10 companies in Korea. In addition, company A has completed 17 cable-stayed bridge and suspension bridge projects, whereas company B has only completed a few bridge projects, all of which were shorter than 300 m; thus, company B has not completed any super long-span bridge projects. In

terms of the performance in overseas and long-span bridge projects, company A was more competent than company B. As the external factors provided an opportunity for the two companies, the proposed framework proposed an integrated joint venture entry mode for company A and a joint venture for company B. In the actual project, company A selected an integrated joint venture mode in which its share of the project was 60% and company B chose a joint venture mode with a share of 40%.

#### iv. Conclusion

This study proposed an entry mode selection framework for use by international contractors attempting to expand into the international construction market by addressing the following two questions: “Which factors affect the decision of the entry mode?” and “How do the factors affect the decision of the entry mode?” A methodology that is widely used in the field of business, “The five elements of strategy,” was employed to answer these questions. For further strategy analyses, external and internal factors of the arena, differentiator, and vehicle elements were investigated. The arena factors consisted of market entry opportunity assessment, business environment, and entry experience and the differentiator factors comprised a project risk assessment in an early stage of a project (e.g., bid preparation of the contracting stage) and contractor competence, classified into technical and management capabilities. In the end, optimal entry modes are derived after separately assessing the differentiator and arena factors.

For the final framework outcome, country assessment, risk management, and contractor competence were plotted on an x-y plane to derive the entry mode according to the assessment result. To validate the framework and proposed entry mode, real data on super long-span bridge projects were evaluated. Experts were interviewed to compare the proposed entry mode to the actual entry mode of a project. The results showed that the proposed and actual entry modes were matched, validating the proposed framework.

This research aimed to provide a framework to support the decision-making process of contractors attempting to expand their contracts to international projects, a market that is rapidly increasing. However, the effect of entry mode on the project outcome was not analyzed. Further studies should include detailed analyses of both differentiator and arena to correlate the project outcome and entry mode decision to create an integrated model for international project planning.

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