

CASE STUDY OF THE NATIONAL STADIUM: RISKS AND OPPORTUNITIES IN CHINA'S PPP IMPLEMENTATIONS IN MAJOR SPORTS FACILITIES

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ABSTRACT: With Beijing's success in bidding for the 2008 Olympic Games, the increasing demand for infrastructure development and reduced public sector funding capacity has created a significant funding gap which calls for alternative project delivery methods such as Public-Private Partnership (PPP). Although the exploration of infrastructure projects using PPP model have been practiced since the late 80s, the \$560 million National Stadium which served as the main venue for the Olympic Games is the first stadium project in China to be delivered under PPP operation. The project is generally considered successful despite the concession transfer in 2009 with concern of better serving the public interest. Compared to other infrastructure projects such as transportation, waste management and water management, the development of major sports facilities for mega-sports events with PPP has its own unique features and is subject to different major risks. This research identifies and analyzes critical risks in the implementation of PPP in major sports facility development through case study of the National Stadium project. A questionnaire survey and several interviews are conducted to solicit expert opinions from experienced practitioners. The purpose is to provide additional insights in risk management strategies and opportunities in China's PPP implementations in major sports facilities for policy makers and private sectors involved with investment decisions in future similar infrastructure development.

Keywords: Public-Private Partnership; Risk Management; Beijing National Stadium; Major Sports Facilities

1. INTRODUCTION

Ever since its first bid for the 27th Olympic Games in 1991, the Chinese government has been seeking vigorously to attract mega-sports events which not only represent a unique opportunity for urban development (Cabral and Silva Jr. 2010) but could also help establish the host region's globe reputation (Mission Hills China 2009). However, despite the potential economic benefits, the specialized infrastructure investment and operating expenses can be extremely costly (Matheson and Baade 2004). In early 2000, with Beijing's success in bidding for the 2008 Olympic Games, the increasing demand for infrastructure development and reduced public sector funding capacity has created a significant funding gap (Sachs et al 2007). Moreover, with a series of upcoming international sports events including the 2010 Asian Games in Guangzhou, the 2011 Summer Universiade in Shenzhen, a string of international tennis and golf tournaments, as well as the possible application of hosting the 2018 Winter Olympics in Harbin and the 2026 World Cup (Mission Hills China 2009), China is undoubtedly facing a boom-period for the construction or

renovation of major sports facilities which cannot be completed by the government alone (Sachs et al 2007). In order to help relieve the burdens on the government's budget and to improve the efficiency of infrastructure development, alternative project delivery methods such as Public-Private Partnership (PPP) is adopted worldwide by encouraging private partners to co-invest with different levels of involvement and responsibility (Efficiency Unit 2003, Chan et al 2009, Liu et al 2010). However, although China has been continuously practicing PPP for its infrastructure projects since the late 1980s, and has gained many successful experiences with transportation, waste treatment, water supplies and electrical power projects etc. (Xu et al 2010), PPP implementation in major sports facility development has remain an uncharted area until the National Stadium (also known as the "Bird's Nest") project in Beijing. The National Stadium is designed to serve as the main venue for the 2008 Olympic Games and is the first stadium project in China to be delivered under PPP operation (Yuan et al 2010). Despite the fact that the government took over the 30 year concession in 2009 (National Stadium News 2009a), both public and private sectors consider this

project to be a great success in exploring PPP model in sports-related infrastructure development. Unlike other projects in which the private sector is forced to renegotiate operation right with the government because of insufficient revenue income or unforeseen high operation and maintenance expenses, the main reason for the concession transfer of the National Stadium is to achieve a balance point of social benefits and economic benefits. Compared to other infrastructure projects, the development of sports facilities for mega-sport events with PPP in China has its own unique features such as the heavy concern for the project's public image, different demands during and after the event etc. Thus the projects are subject to different major risks. This research identifies and analyzes critical risks in the implementation of PPP in major sports facility development through case study of the National Stadium project. A questionnaire survey and several interviews are conducted to solicit expert opinions from experienced practitioners. The purpose is to provide additional insights in risk management strategies and opportunities in China's PPP implementations in major sports facilities for policy makers and private sectors involved with investment decisions in future similar infrastructure development.

2. PROBLEM STATEMENT

The National Stadium is the main venue of the 2008 Beijing Olympic Games which hosts the opening and closing ceremonies, the track and field competitions, and the football finals. Located at the southern part of the Olympic Green in Beijing and occupying an area of 21 hectares, it has a floor space of 258,000 square meters with seating capacity amounts to 91,000, including 11,000 temporary seats (National Stadium News 2009b). The stadium is designed to host large-scale sports and entertainment events after the Olympics.

Construction began in December 2003 and was completed in June 2008. In December 2007, construction work had been suspended for one and a half year due to the perceived high construction costs (Yuan et al 2010). Eventually the originally designed retractable roof was omitted and the whole project was delayed 6 months behind schedule (Liu et al 2010). The project also encountered cost overrun from the initial budget of 1.6 to 2 billion RMB (National Stadium News 2009c) to the final cost of 3.5 billion RMB (Yuan et al 2010).

In August 2003, after a nine month open bidding procedure, a consortium led by China International Trust and Investment Corp. (CITIC) won the bid for the National Stadium project (National Stadium News 2009b). The consortium comprises the state-owned CITIC Group and Beijing Urban Construction Group (BUCG), and the private Golden State Holding Group of the United States and Guoan Elstrong from Hong Kong, an affiliate of the CITIC Group (Yuan et al 2010). In September, the consortium and Beijing State-owned Assets Management Corporation (BSAM), a representative of the Beijing municipal government jointly set up the project company

National Stadium Co. which would be responsible for financing, construction, operation and management of the project. Under the agreement, the public sector shares 58% of the total assets, while the consortium holds the rest and a post-Games licensed concession for 30 years (National Stadium News 2009b).

In August 2009, one year after operating the National Stadium, the CITIC consortium signed an agreement with Beijing municipal government and officially transferred the 30-year concession back to the government. While the equity share of both parties remains the same, an operation and maintenance coordinating team led by Beijing municipal government was formed to take full responsibility for any risks during the operation and maintenance period of the National Stadium (National Stadium News 2009a).

Despite this reform in the PPP model, Mr. Jiulin Li, chief engineer of the project, stated: "It is a win-win situation for both private and public sectors" in one of the interviews conducted by the authors. It then rises three questions this paper trying to answer:

- (1) What's the main reason for the transfer of concession?
- (2) What are the major risks incurred in the National Stadium problem?
- (3) What are the risks and opportunities in China's PPP implementations in major sports facilities?

3. LITERATURE REVIEW

A considerable amount of prior research has been devoted to identify general risks for PPP implementation in China such as Chan et al (2010); Ke et al (2010); Xu et al (2010). The top 10 most critical risks and associated definitions are summarized in Table 1.

However, few have been done to study the risks that are related to the construction and operation of major sports facilities, especially in China. According to The Lille Council of Local Municipalities (LCMU) in France, the main risks for football stadium projects are: (1) preliminary risk associated with the bidding process; (2) conception and construction risks including clearly defined project scope, obtaining legal authorizations to initiate the construction and various construction technical risks; (3) financial risks associated to fluctuations in interest and inflation rates; and (4) exploitation risks referring to the sports performance risks of the host team and inaccurate estimation of the operation and maintenance costs (LCMU 2006, Cabral and Silva 2010). Wang and Ke (2008) pointed out that major risks encountered in the National Stadium project include: construction risk, market risk, operation risk, and political and legal risk. A more detailed study is needed in order to understand the principle risks in China's PPP implementations in major sports facilities and how they are different from other infrastructure projects.

Table 1. Top ten critical risk factors (Adopted from Xu et al (2010) and Ke et al (2010))

Ranking	Risk factor	Definition
1	Government intervention	Public sector interferes unreasonably in the project execution
2	Poor public decision-making process	Government officials consider more about their career achievement or short-term goals or personal interests, or with little PPP experience etc., resulting in a poor political decision-making process
3	Corruption	Corrupted local government officials demand bribes or unjust rewards
4	Financing risk	Poor financial market or unavailability of financial instrument
5	Immature law and supervision system	The lack of national PPP law leads to different ways of PPP implementation in different places
6	Government credit	The reliability and creditworthiness of the government to be able and willing to honor their obligations in future
7	Subjective project evaluation method	Subjective evaluation of market demand leads to poor design of the concession period, tariff structure, etc.
8	Interest rate fluctuation	Unanticipated local interest rate change due to immature local economic and banking systems
9	Conflicting or imperfect contract	Improper arrangements in the contracts including inappropriate risk allocation among stakeholders
10	Change in market demand	Demand change due to various factors

4. PILOT STUDY ON RISKS OF MAJOR SPORTS FACILITY DEVELOPMENT

4.1 Methodology

A pilot study was conducted from September to November of 2010 in Beijing and a total of 20 practitioners/academics were identified and invited to participate in this study including general contractors, engineers, lawyers, consultants, project managers and professors. Figure 1 shows the backgrounds of the respondents:

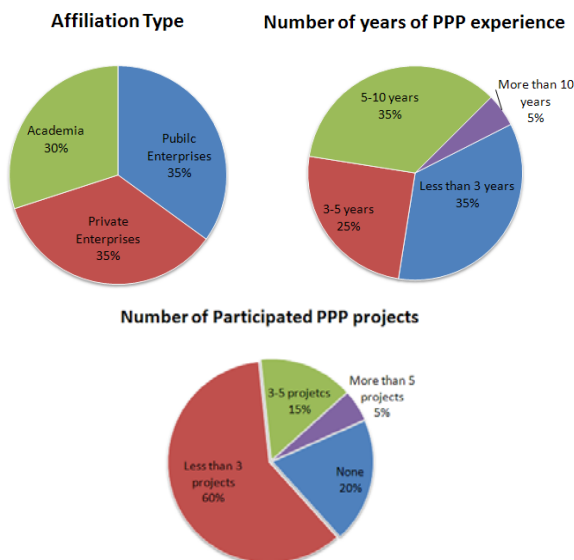


Figure 1. PPP backgrounds of respondents

In the questionnaire, respondents were asked to: (1) Evaluate the National Stadium project from eight aspects including Project duration, Quality, Cost, Dispute resolution, Relationship between public and private

sectors, Social benefits, Operation & Maintenance and Life-cycle evaluation based on a six-point Likert scale (0 – Very poor, 1 – Poor, 2 – Fair, 3 – Good, 4 – Very good and 5 – Excellent); (2) Rank 32 risk factors identified by Xu et al (2010) for general PPP projects in China and for the National Stadium project respectively according to a 0-5 weighting system with 0 representing “barely any influence” and 5 representing “critical influence”. Upon completion of the initial data collection work, the data were analyzed using both summary measures and statistical analyses.

4.2 Data Analysis 1: Project Evaluation

Table 2. Project Evaluation

	Mean	Variance	Ranking
Project duration	4.55	0.26	1
Quality	4.40	0.25	2
Life-cycle evaluation	3.95	0.58	3
Relationship between public and private sectors	3.85	0.66	4
Social benefits	3.65	0.24	5
Operation & Maintenance	3.00	0.32	6
Dispute resolution	2.55	0.47	7
Cost	1.40	0.46	8

According to the ranking in Table 2, most respondents consider duration and quality to be satisfying. It is important to note that although the project is 6 months behind schedule, there was one and half year suspense during the construction phase. In other word, if it was not for the design change, the project could have been completed one year ahead of schedule even with high construction technical requirements. In contrast, huge cost overrun was the most severe problem. The over complex retractable roof was forced to be cancelled to save budget, and has caused a major dispute between the

Beijing municipal government and the project company. Because of this change order, the design consortium claimed 40 million RMB for redesigning almost all the steel structure, which was about one-third of the primary design fee (120 million RMB) (Liu et al 2010). The dispute was not settled until the end of 2008 with the Beijing municipal government bearing most of the redesign costs (Liu et al 2010). Despite this dispute, the public and private sectors have managed to maintain an amicable relationship, and have expressed the intendency for future cooperation according to a follow-up interview with Chief Engineer Juilin Li.

4.3 Data Analysis 2: Comparison of rankings of risk

factors for the National Stadium project and general PPP projects in China

Based on the results of questionnaire in Table 3, the top 10 critical risk factors for general PPP projects are: Government Credit, Government Intervention, Political/Public Opposition, Immature law and supervision system, Poor Public Decision-making Process, Subjective Project Evaluation Method, Corruption, Conflicting or Imperfect Contract, Payment risk, and Delay in Project Approvals and Permits. Among the listed 10 factors, 7 are also considered as top 10 critical risk factors according to Xu et al (2010), except Political/Public Opposition, Payment risk, and Delay in Project Approvals and Permits. This paper will use

Table 3. Comparison of ranking of risk factors for the National Stadium project and general PPP projects in China

Risk Factors	National Stadium			General PPP Projects		
	Mean	Variance	Ranking	Mean	Variance	Ranking
Government Intervention	4.35	0.24	1	3.75	0.20	2
Subjective Project Evaluation Method	3.95	0.68	2	3.55	0.37	6
Nationalization/Expropriation	3.70	0.75	3	3.20	0.48	20
Construction Delay	3.40	2.04	4	3.25	0.20	17
Demand Change	3.35	0.98	5	3.45	0.26	10
Operation Cost Overrun	3.30	0.33	6	3.35	0.24	12
Immature law and supervision system	3.20	0.69	7	3.65	0.24	4
Unproven Engineering Techniques	3.20	0.91	7	2.90	0.09	29
Poor Public Decision-making Process	3.15	2.24	9	3.60	0.57	5
Force Majeure	3.15	0.56	9	2.95	0.47	28
Payment risk	3.10	0.41	11	3.55	0.37	6
Conflicting or Imperfect Contract	3.00	1.05	12	3.55	0.79	6
Price Change	3.00	0.00	12	3.05	0.05	25
Inflation	2.95	0.89	14	3.35	0.24	12
Inability of Concessionaire	2.95	0.37	14	3.35	0.24	12
Market Competition	2.95	1.00	14	3.30	0.22	15
Inadequate Competition In Bidding	2.65	1.08	17	3.10	0.20	22
Third Party Delay/Violation	2.60	0.57	18	3.00	0.11	26
Government Credit	2.55	1.42	19	4.05	0.47	1
Interest Rate Fluctuation	2.45	1.10	20	3.30	0.22	15
Financial Risk	2.35	0.87	21	3.10	0.09	22
Change in Tax Regulation	2.30	1.17	22	3.25	0.20	17
Residual Risk	2.30	1.38	22	2.80	0.59	32
Corruption	2.30	0.85	22	3.55	0.58	6
Poor Organization and Coordination	2.15	0.66	25	3.60	0.57	5
Political/Public Opposition	2.10	1.15	26	3.70	0.43	3
Lack of Supporting Infrastructure	1.95	0.89	27	2.90	0.09	29
Concessionaire Change	1.70	0.33	28	3.00	0.21	26
Exchange Rate Risk	1.45	0.47	29	3.20	0.91	20
Unforeseen Weather/Geotechnical Conditions	1.25	0.72	30	2.85	0.24	31
Delay in Project Approvals and Permits	1.15	0.13	31	3.45	0.26	10

Land Acquisition	0.90	0.41	32	3.25	0.51	17
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the survey results to compare to critical risk factors for the National Stadium project in order to be consistent.

For the National Stadium project, the top ten critical risk factors are not quite the same. There are five different risk factors: Nationalization/Expropriation, Construction Delay, Operation Cost Overrun, Unproven Engineering Techniques, and Force Majeure. The following paragraphs will analyze each factor to show why it is considered as critical risk factors for major sports facilities like the National Stadium.

Nationalization/Expropriation

Nationalization/Expropriation means that local government takes over the facility run by the private sector due to political, social or economic reasons (Ke et al 2010). It was exactly the case with the National Stadium project when the public and the private sector signed the Agreement on Further Strengthening the Operation, Maintenance and Management of the National Stadium in 2009 (National Stadium News 2009a) and transferred the concession right to the government. However, unlike other unsuccessful PPP projects such as the Shanghai Dachang Water Plant which were taken over by the government because of public opposition of pricing rising (Qi et al 2009), the transfer of National Stadium's operation right is more due to social concerns. With Beijing successfully hosting the Olympic Games, iconic facilities such as the National Stadium or the National Aquatics Centre (also known as "the Water Cube") are considered by the Chinese people to be a symbol of the country's prosperity instead of merely ordinary sport venues. For the Chinese government, it is also an opportunity to demonstrate to the world China's ability to utilize the Olympics to help the development of social benefits for a wider population (Sachs et al 2007). As a result, although most of the revenue of the National Stadium relies on tourism income, the government discourages commercial activities such as selling the naming right of the stadium or accepting sponsorship from private companies that are not considered suitable from the government's point of view to better serve public interests (China Weekly 2010). Thus, achieving the balance of social benefits and economic benefits will always remain a significant risk for major sports facilities in China.

Construction Delay

One of risks for major sports facilities is the tight schedule of the construction. Different from general PPP projects, major sports facilities are built to serve mega sports events. Any delay of the project could lead to serious political problems. As a result, this type of projects normally has heavy liquidated damage provisions. For example, according to the concession agreement for the National Stadium project,

"If any Critical Event Completion Date does not occur prior to or on its Critical Event Date, the Project Company must pay liquidated damages for the period from the relevant Critical Event Date to the actual Critical Event Completion Date the amount of which shall be calculated as follows:

- 1) *thirty thousand US dollars (US\$ 30,000) a day for each day of delay for the first twenty (20) Business Days of delay;*
- 2) *fifty thousand US dollars (US\$ 50,000) a day for each day of delay for the next twenty (20) Business Days of delay;*
- 3) *one hundred thousand US dollars (US\$ 100,000) a day for each day of delay thereafter."*

However, there were only about three years allowed between the signing of the Concession Agreement and required construction completion date even with the high technological standards (Liu et al 2010). Construction delay therefore could become a severe problem for the development of major sports facilities even with massive policy support.

Operation Cost Overrun

Despite a 60 million RMB of annual operation and maintenance fee, according to an official report the project company has managed to avoid operation cost overrun for the last two years (China Weekly 2010). However, because of the unique features of major sports facilities, the revenue risk caused by the dramatic change in market demand during and after the events could still be a difficult issue in the long term, especially when the government is aiming at establishing the facility's public image by only encouraging non-commercial and large-scale events (Liu et al 2010).

Unproven Engineering Techniques

In the past one decade, with rapid growing economy, China's architecture showed strong desire to innovate. Among top ten Chinese modern architecture selected by Chinese Architecture 2010, Shanghai World Financial Center, Central Chinese Television CCTV, National Grand Theater all have unusual shapes. For iconic facilities such as Olympic venues or possible football stadiums for the World Cup in the future, architecture with unique features is obviously more welcome in order to stand out from the neighbors. However, complex structures require advanced engineering techniques that might not been used before, which might further lead to construction delay or cost overrun, as in the case of the highly complex retractable roof for the National Stadium.

Force Majeure

It is not difficult to see that force majeure such as change of political environment, foreign policy of the central government, wars etc. tend to have more impact on the development of major sports facilities such as the

National Stadium, which are designed to host world-wide mega events.

5. CONCLUSIONS

China's success in holding the 2008 Beijing Olympics proved its ability to host world-class sporting events. The Olympics also showed China the economic potential and intangible benefits of mega-sports events. While China is facing the upcoming boom of major sports facility development, the National Stadium project as the first stadium project under the PPP model has provided valuable experience for both public and private sectors. In the pilot study, five risk factors that are especially critical to major sports facilities are identified and analyzed. Other than common risk factors for PPP projects in China such as Government Intervention or Subjective Project Evaluation Method, policy makers and private investors should pay more attention to Nationalization/Expropriation, Construction Delay, Operation Cost Overrun, Unproven Engineering Techniques, and Force Majeure in the future development of major sports facilities. However, it is important to note that the data presented herein were collected from only a small sample size and the respondents were not randomly chosen. A second round of surveys on a larger sample size and a more detailed data analysis are needed for future research.

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