

A Comparative Study of Critical Success Factors for Public Private Partnerships (PPP) between Mainland China and the Hong Kong Special Administrative Region

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Abstract

Purpose

This paper aims to explore the Critical Success Factors (CSFs) necessary for adopting Public Private Partnerships (PPPs) in both mainland China and Hong Kong.

Design/methodology/approach

An empirical questionnaire survey was conducted with relevant experienced practitioners in mainland China and Hong Kong.

Findings

Both mainland China and Hong Kong have been keen to deliver more infrastructure service projects through PPP mode, with the former aiming to meet its rapidly growing infrastructure demand and the latter uplifting its efficiency further. The results indicate that Hong Kong does not regard multi-benefit objectives as importantly as mainland China. Mainland China on the contrary felt more concerned with an equitable risk sharing mechanism, which is understandable given the problems affecting the financial market in mainland China.

Originality/value

It is anticipated that the results presented in this paper will assist both the public and private sectors to deliver PPP projects more successfully.

Keywords: Procurement; Success; Project Management.

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1. Introduction

A major push for the “business approach” of public facilities and services in the United Kingdom was given in the 1980s when the government put out to tender some of its traditional duties in the provision of infrastructure. The idea was to seek the best value possible (Fitzgerald and Melvin, 2002). PPP was first introduced in the United Kingdom in 1992 (Rodney and Gallimore, 2002), in the form of Private Finance Initiative (PFI) as a way of procuring public infrastructure by getting the private sector to finance, build and operate it under contracts typically lasting 25 to 30 years (Tieman 2003). Since its introduction, PFI has been the government’s preferred method of public infrastructure procurement (Handley-Schachler and Gao 2003). As a result PFI now accounts for between 10 to 14 per cent of Britain’s total annual investment in public services. In 2003, total investment under PFI was forecast to reach £4.6 billion (Tieman 2003). After almost 50 studies, the National Audit Office (NAO) had concluded that when PFI functioned properly, it delivered both better value and better infrastructure. Furthermore, according to an NAO review in 2003, 78% of PPP/PFI projects were delivered within budget, and 76% on time (Tieman 2003). However, Maltby (2003) asserted that PFI should be abolished for smaller projects and for information technology schemes. Similarly, Kanning and Vogler (2008) also mentioned how stakeholders were often reluctant with launching PPPs as attitudes are not positive enough, controllability was not perceived as high enough, and because the subjective norm for the implementation of PPPs was too low. It is clear that PPP is not a panacea to solve all problems and may not be suitable for all project settings. It is therefore important to explore the successful ingredients for delivering PPP projects.

PPP has been well practiced in many developed countries in Europe, America and Australia for delivering construction and building projects. The success and advantages of adopting PPP in these places have been well documented. But unfortunately not all of these PPP projects have been equally successful. For countries that are new at adopting PPP it is even more important for them to identify the CSFs in order to maximize the advantages of this method and to reduce the risks for all concerned parties.

With the rapid development being experienced in China, there has been a strong cry for more and better public facilities and services. In order to deal with the large infrastructure plan proposed for the coming years, the Chinese government has been keen to seek alternative methods to relieve their financial burden. Together with the economic opportunities foreseeable in China many international investors have also been attracted to the Chinese business market. As a result PPP has become an ideal option favored by both the public and private sectors. To cope with the increased number of PPP projects foreseeable in near future, there is a strong need to study the practice of this method in China. As part of a larger research study looking at developing a best practice framework for PPPs, this paper presents the findings of the CSFs necessary to ensure smooth sailing PPP projects.

2. Literature review of PPP Critical Success Factors

A comprehensive literature review was conducted to study the CSFs of PPP. Contemporary literature including research reports, journal articles, conference papers and internet materials were identified and reviewed thoroughly. Table 1 shows a summary of the analysis of these pieces of literature. From the literature review, fifteen key CSFs of PPP were identified. For each CSF identified the number of times it was mentioned amongst the seventeen pieces of literature was recorded. The identified CSFs could be grouped under seven principal headings:

- 1) Equitable allocation of risks
 - Appropriate risk allocation
- 2) Strong private consortium
 - Strong private consortium
 - Good partners' relationship
 - Technology transfer
 - Effective management control
- 3) Judicious government control
 - Government guarantee
 - Consultation with end-users
 - Appropriate project identification
- 4) Transparent and efficient procurement process
 - Competitive and transparent procurement process
 - Clear project brief and client requirements
- 5) Project economic viability
 - Project economic viability
 - Business diversification
- 6) Adequate legal framework and stable political environment
 - Strong government support
 - Stable and transparent political/social situation
- 7) Available financial market
 - Available financial market

Insert TABLE 1 here.

2.1 Equitable allocation of risks

A core principle in PPP arrangement is the allocation of risk to the party best able to manage and control it (Efficiency Unit 2003). Logically, the government would prefer to transfer risks associated with asset procurement and service delivery to the private sector participants, who are generally more efficient and experienced in managing them. But the government should be reasonable to take up risks that are out of the control of private sector participants. In all cases, the government should ensure there are measures in place to manage the risk exposure rather than leaving it open to the private sector. Likewise before committing to the projects, the private sector participants should fully

understand the risks involved and should be prudent in pricing and managing the risks appropriately (Grant 1996; Qiao et al. 2001; Zhang 2005).

Increasingly more PPP projects are done through careful considerations on risk allocation. Each organization takes on risk that it has expertise to handle. For example, Bilfinger Berger Civil and CH2M Hill are sharing the design, engineering and project management duties of the Golden Ears Bridge, Vancouver, Canada. They are aided by nineteen other companies with various expertises for better risk allocation of different tasks. The Project Manager of this project has also previously worked on the Kaohsiung High Speed Railway in Taiwan and the Tsing Ma Bridge in Hong Kong (Staff 2006).

2.2 Strong private consortium

The government in contracting out the PPP projects should ensure that the parties in the private sector consortium are sufficiently competent and financially capable of taking up the projects. This suggests that private companies should explore other participants' strengths and weaknesses and, where appropriate, join together to form consortia capable of synergizing and exploiting their individual strengths. Good relationship among partners is also critical because they all bear relevant risks and benefits from the co-operation (Abdul-Rashid et al. 2006; Birnie 1999; Corbett and Smith 2006; Jefferies et al. 2002; Kanter 1999; Tam et al. 1994; Tiong 1996; Zhang 2005).

The majority of PPP projects tend to constitute a strong private consortium in order for the method to work. For example, the London Underground Connect PFI contract in the United Kingdom was awarded to a financially strong company, CityLink Telecommunications Limited, a company created to undertake a 20 year Connect contract for London Underground. Its shareholders include Thales (33%), Fluor (18%), Motorola (10%), Laing Investment (19.5%) and the Hong Kong and Shanghai Banking Corporation Limited (19.5%). The cost of the design, build and maintain contract is £2 billion over 20 years (Transport for London 2007; PublicTechnology.Net 2007).

Chaos is likely to become increasingly familiar for commuters of Sydney City Rail, as the management of CityRail is accused as the worst in the world (7 News 2007; Heath 2007; Kerr and Dick 2004). This indicates that a strong private consortium is therefore important for the successful implementation of PPP.

Apart from financial muscle, the strength of private sector participants lies in the management team they deploy. For example, the Ministry of Energy and Mines of the British Columbia Government in Canada made open remarks that the concessionaire of the Sierra Yoyo Desan Road project had assembled a capable team with extensive experience throughout northern British Columbia (Ministry of Energy and Mines 2003).

The strength of the private consortium will also be affected by its relationship with the public sector. Love et al. (2000) mentioned that two fundamental attributes for procuring successful infrastructure projects are commitment and mutual trust, which need to come from both the public and private sectors.

2.3 Judicious government control

Under PPP contracts the government should be concerned that the assets are procured and services are delivered on-time with good quality and meet the pre-agreed service benchmarks or requirements throughout the life of the contract. However, the government should be less concerned with “how” these are achieved and should not impose undue restrictions and constraints on private sector participants. The government should be relegated to the primary role of industry and service regulation; should be flexible in adopting innovations and new technology; should provide strong support and make incentive payments to the private sector where appropriate. On the other hand, the government should retain controls in case of default and be prepared to step in and re-provide the service if necessary (Abdul-Rashid et al. 2006; Corbett and Smith 2006; El-Gohary et al. 2006; Jamali 2004; Kanter 1999; Li et al. 2005; Tam et al. 1994; Tiong 1999; Zhang 2005).

In the United Kingdom, the government has promptly approved arrangements for funding and constructing the Birmingham Northern Relief Road which the concessionaire, Midland Expressway Limited, has signed up so that work on the road can start as planned (M2 Presswire 2000). Thus a strong government support is indispensable to launch a new PPP project.

2.4 Transparent and efficient procurement process

A transparent and efficient procurement process is essential in lowering the transaction costs and shortening the time in negotiation and completing the deal. Clear project brief and client requirements should help to achieve these in the bidding process. In most cases, competitive bidding solely on price may not help to secure a strong private consortium and obtain value for money for the public. The government should take a long-term view in seeking the right partner (Corbett and Smith 2006; Gentry and Fernandez 1997; Jefferies et al. 2002; Jefferies 2006; Li et al. 2005; Qiao et al. 2001; Zhang 2005).

Indeed, an objective, competitive and fair transparent procurement process is conducive to the successful implementation of a PPP project; otherwise, legal battle would be invoked easily. For instance, residents fighting to stop the Birmingham Northern Relief Road (BNRR) has been awarded discovery of significant parts of the secret Concession Agreement despite the private contractor's protests to the Judge (Bradshaw-Smith 2007).

In Canada, the government has placed concerted efforts in making the public community know of the whole procurement process as in the cases of Golden Ears Bridge in Vancouver (Dickson 2006) and of Sierra Yoyo Desan Road in British Columbia (Ministry of Energy and Mines 2003), in order to make the procurement process more transparent towards the general public.

2.5 Project economic viability

For projects where the major source of revenue to the private sector is generated from direct tariffs levied on users, there are revenue risks that can go beyond the control of the private sector like, for example, future usage level and permitted tariff charges. There may also be unforeseen risks during the course of project life. To ensure project economic viability, the government may consider some forms of government guarantees; joint investment funding or supplemental periodic service payments to allow the private sector cover the project costs and earn reasonable profits and investment returns. At the same time, the government should take due consideration of private sector's profitability requirements in order to have stable arrangements in PPP projects. Alternative sources of income and financing like property development opportunities along the railway can be sought to bridge the funding gap for private investors (Abdul-Rashid et al. 2006; Corbett and Smith 2006; Li et al. 2005; Nijkamp et al. 2002; Qiao et al. 2001; Tam et al. 1994; Tiong 1996; Zhang 2005).

If the profit generated is decreased, the development of a railway project will be affected. Passenger levels in the Croydon Tramlink project in London of United Kingdom turned out to be 25-30% lower than expected and so a lot of money is lost, which may affect the economic viability of the project to expand its capacity (Public Private Finance 2007; Wood 2003). In a balance between public affordability and private profitability, it is not uncommon to see government bestowing periodic service payments to private sector consortium to cover the project costs and reasonable profits with the purpose of sustaining the provision of public transportation services (Jamali 2004; Nijkamp et al. 2002; Qiao et al. 2001; Tam et al. 1994).

The economic viability of the Sierra Yoyo Desan Road is obvious due to the fact that it will provide the primary access to more than 27,000 square kilometers of oil and gas territory.

2.6 Stable political and social environment

Successful PPP implementation requires a stable political and social environment, which in turn relies on the stability and capability of the host government (Wong 2007). Political and social issues that go beyond private sector's domain should be handled by the government. If unduly victimized, it is legitimate that the private sector participants should be adequately compensated. Unstable political and social environments have resulted in some failed rail projects (e.g. frequent change in government premiers in Bangkok leading to the cancellation of many new public infrastructure projects originally procured under the PPP approach).

2.7 Adequate legal framework

As mentioned by the National Treasury PPP Unit of South Africa (2007), an independent, fair and efficient legal framework is a key factor for successful PPP project

implementation. Sufficient legal resources at reasonable costs should be available to deal with the amount of legal structuring and documentation required. A transparent and stable legal framework should help to make the contracts and agreements bankable. An adequate dispute resolution system should help to ensure stability in the PPP arrangements. Appropriate governing rules, regulations and reference manuals related to PPP have been well established in some developed countries (e.g. United Kingdom, Australia, Canada, South Africa, etc.) to facilitate the effective application of PPP procurement approach.

2.8 Available financial market

Many researchers (Akintoye et al. 2001; Corbett and Smith 2006; Jefferies et al. 2002; Li et al. 2005, Zhang 2005) have found that project financing is a key factor for private sector investment in public infrastructure projects. The availability of an efficient and mature financial market with the benefits of low financing costs and diversified range of financial products would be an incentive for private sector taking up PPP projects.

3. Previous research on PPP Critical Success Factors

The questionnaire template designed by Li (2003) was adopted for this study. Although the authors could have developed their own research questionnaire, there were several advantages foreseeable to adopt Li's (2003) survey questionnaire rather than designing a new template. Firstly, the value of Li's (2003) questionnaire has already been recognized by the industry at large. His publications as a result of the research findings derived from the questionnaire are evidence of its worthiness. Secondly, there would be no added advantage to reinvent the work that has previously done by other researchers. And thirdly by administering Li's (2003) questionnaire in different administrative systems, it would be of interest for comparison purposes in the future. Therefore Li's (2003) questionnaire was adopted for the survey as presented in this paper with prior permission obtained from the author Dr. Bing Li and his doctoral research supervisor, Prof. Akintola Akintoye who is currently the Head of the School of Built and Natural Environment, University of Central Lancashire, United Kingdom.

4. Research methodology

4.1 Collection of research data

An empirical questionnaire survey was undertaken in both mainland China and Hong Kong to compare and contrast the CSFs of PPP in these two similar and yet different administrative systems. In this study, the target survey respondents of the questionnaire included all industrial practitioners from the public, private and other sectors. These respondents were requested to rate their degree of agreement against each of the identified CSFs according to a five-point Likert scale (1 = Least Important and 5 = Most Important).

Target respondents were selected based on their direct hands-on involvement with PPP projects. Survey questionnaires were sent to 103 target respondents in mainland China (administered in Beijing) and 95 target respondents in Hong Kong. It was anticipated that some of these target respondents would have colleagues and personal connections knowledgeable in the area of PPP to participate in this research study as well; hence some of the respondents were dispatched five blank copies of the survey form. A total of 53 completed questionnaires from mainland China and 34 from Hong Kong were returned representing response rates of 52% and 36%, respectively. Although there were a total of 87 responses received, only 86 were valid for subsequent statistical analyses including 53 from mainland China and 33 from Hong Kong. Figure 1 shows that amongst these respondents, 45% of them were from the private sector, 16% from the public sector and 39% from other organizations (mainly academics and researchers).

The higher response rate in mainland China compared to Hong Kong was anticipated. There have not been that many PPP projects in Hong Kong hence the number of people involved with PPP projects would be less. Mainland China on the other hand has launched more PPP projects recently in comparison with Hong Kong. Also, the population size in the mainland is much higher than Hong Kong. China has a booming population size of 1.32 billion as recorded in March 2008 (China Population Development and Research Center 2008), and although Hong Kong is densely populated for a city of its size, its population is much smaller than China at only 6.96 million at the end of 2007 (Census and Statistics Department 2008). After its reversion to China, Hong Kong has operated a different administrative system from that in the mainland under the “one country, two systems” principle.

Insert FIGURE 1 here.

4.2 Tools for data analysis

4.2.1 Mean score ranking technique

Chan et al. (2010) adopted the ‘mean score’ method to establish the relative importance of the perceived benefits of the Pay for Safety Scheme (PFSS) in Hong Kong as advocated by the clients and contractors. The data collected from the current questionnaire survey was also analyzed using the same technique, within various groups being categorized according to the origins of the respondents (i.e., mainland China and Hong Kong). The five-point Likert scale (1 = Least Important and 5 = Most Important) as described previously was used to calculate the mean score for each CSF, which was then used to determine its relative ranking in descending order of importance. These rankings made it possible to triangulate the relative importance of the CSFs to the respondents from mainland China and Hong Kong. The mean score (MS) for each CSF was computed by the following formula:

$$MS = \frac{\sum (f \times s)}{N}, (1 \leq MS \leq 5) \quad (1)$$

where s = Score given to each CSF by the respondents, ranging from 1 to 5 (1 = Least Important and 5 = Most Important);

f = Frequency of each rating (1-5) for each CSF; and

N = Total number of responses concerning that CSF.

4.2.2 Kendall's concordance analysis

The survey respondents were based on two groups: mainland China and Hong Kong. Kendall's concordance analysis was conducted to measure the agreement of different respondents on their rankings of CSFs based on mean values within a particular group. If the Kendall's coefficient of concordance (W) is significant at a pre-defined allowable significance level of, say 0.05, a reasonable degree of consensus amongst the respondents within the group on the rankings of CSFs was indicated. The W for the CSFs was calculated by the following formula (Siegel and Castellan 1988):

$$W = \frac{\sum_{i=1}^n (\bar{R}_i - \bar{R})^2}{n(n^2 - 1)/12} \quad (2)$$

Where n = Number of CSFs being ranked;

\bar{R}_i = Average of the ranks assigned to the i th CSF; and

\bar{R} = The average of the ranks assigned across all CSFs.

According to Siegel and Castellan (1988), W is only suitable when the number of attributes is less than or equal to 7. If the number of attributes is greater than 7, chi-square is used as a near approximation instead. The critical value of chi-square is obtained by referring to the table of critical values of chi-square distribution, which can be found in Siegel and Castellan (1988).

4.2.3 Spearman rank correlation test

The level of agreement between the two respondent groups (mainland China and Hong Kong) on their rankings of CSFs was measured by the Spearman rank correlation coefficient (r_s). Again, if r_s was significant at a pre-determined allowable significance level of, say 0.05, there is no significant disagreement between the two sets of rankings. The Spearman rank correlation coefficient (r_s) for the CSFs was computed by the following formula (SPSS 2002):

$$r_s = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} \quad (3)$$

where d = The difference in rank of the two groups for the same CSF; and
 N = Total number of responses concerning that CSF.

The analysis procedures described above have also been used in other similar research survey studies such as Chan (2000) and Chan et al. (2003).

4.2.4 Independent 2-sample t-test

Independent 2-sample t-test is used to test for a difference between two independent groups on the means of a continuous variable (SPSS 2002). Several assumptions are made:

- (i) Two independent random samples have been extracted from each population;
- (ii) The two populations are both normally distributed; and
- (iii) The two populations have a common (equal) variance (if the number of cases in each of the groups is similar, then the equality-of-variance assumption is not so important).

The t-statistic can be defined in the following way (Keller 2005):

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\bar{\mu}_1 - \bar{\mu}_2)}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}} \quad (4)$$

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \quad (5)$$

Where n_1 = number of observations for group 1;

n_2 = number of observations for group 2;

\bar{x}_1 = mean of group 1;

\bar{x}_2 = mean of group 2;

$\bar{\mu}_1$ = population mean for group 1;

$\bar{\mu}_2$ = population mean for group 2;

s_1^2 = sample variance for group 1; and

s_2^2 = sample variance for group 2.

5. Discussion of survey results

The CSFs of PPP were assessed from different perspectives of the mainland Chinese and Hong Kong respondent groups. The means for each administrative system were calculated and ranked in descending order of importance as shown in Table 2.

5.1 Ranking of Critical Success Factors of PPP

Amongst the eighteen CSFs, the top five factors for each respondent group were analyzed further. The top CSF ranked by both respondents from mainland China and Hong Kong was 'Favorable legal framework'. This indicated that the respondents in mainland China and Hong Kong felt that the legal framework is the most important CSF. This CSF was the only one that agreed totally on the rank position between the two respondent groups analyzed. Inadequate legal framework has always been a main reason causing problems for PPP projects in China. Rui (2008) presented in his study on how PPP projects of different eras failed due to various problems with the legal framework. For example, the Shen-Da Expressway connecting Shenyang and Dalian was planned in the 1980s at which time there were few laws and regulations pertaining to construction and operation to ensure the right institutional environment for expressway projects. On the other hand, a recent project which was completed in 2004 was the Xiang-Jin Expressway located in Hubei province, encountered problems due to a lack of legal transparency which resulted in corruptive behaviors of officials. Previous experience has demonstrated how important a favourable legal framework can be to the success of PPP projects in China.

The second CSF ranked by mainland Chinese respondents was 'Appropriate risk allocation and risk sharing'. The National Stadium for the Beijing 2008 Olympic Games in China has been praised for its success as a PPP project. Liu et al. (2007) attributed this success down to the appropriate risk allocation and sharing. This CSF was ranked fifth by respondents from Hong Kong. Respondents from both of the two administrative systems ranked this CSF relatively high showing that its importance applies irrespective of geographical differences. But respondents from Hong Kong ranked this CSF slightly lower. This could be due to the fact that Hong Kong has had experience with different procurement systems that entail different risk allocation models, thereby making this factor relatively less critical in terms of its contribution to project success.

The CSF 'Commitment and responsibility of public and private sectors' was ranked third and second by respondents from mainland China and Hong Kong respectively. Again it can be seen that this CSF was ranked high by all respondent groups irrespective of geographic locations. In the case of Shenzhen Water, the Shenzhen Municipal Government sold 45% of its shares to the private sector. This project created a model where the government retains control over strategic assets and the private sector brings in additional capital and management expertise. To secure the success of PPP projects, both the public and private sectors should bring their complementary skills and commit their best resources to achieve a good relationship (National Audit Office 2001).

The fourth CSF ranked by mainland Chinese respondents 'Stable macro-economic condition', was ranked the same by respondents from Hong Kong. This CSF was therefore seen as quite important in mainland China and Hong Kong. In a stable macro-economic environment the market is more predictable, hence lowering risks such as interest rate, exchange rate, employment rate, inflation rate, etc. It is very important to reduce risks and enable a reasonable investment return for private investors, especially in the emerging PPP market like mainland China and Hong Kong.

The only CSF ranked in the top five by mainland Chinese respondents but not by the respondents from Hong Kong was 'Available financial market'. In Hong Kong this CSF was ranked eighth, showing only a medium level of importance. Hong Kong is an international city and some may even regard it as the gateway to China. With the combination of Western and Asian culture many large organizations around the world prefer to base their offices in Hong Kong amongst Asia. With these added advantages Hong Kong's financial market has not been short of opportunities. Relatively, risk factors associated with PPP projects in mainland China in terms of financing distinguish themselves from those in Hong Kong. For instance, the corporate bond market is not sufficiently mature compared with sovereign bonds (Yuan 2004); the syndicated loan market is not prevalent as a source of debt finance (Guo 2001); the arrangement of floating charge on project assets as a guarantee needed for innovative project financing is not well established legally (Li 2005). Thus, it is understandable that respondents from mainland China scored this CSF higher.

Ranked third by respondents in Hong Kong and tenth by mainland Chinese respondents was 'Strong and good private consortium'. This finding has shown that respondents from Hong Kong feel that this CSF is highly important to the success of PPP projects. The mainland Chinese respondents on the other hand ranked it rather low. According to previous studies on PPP risks in mainland China, such as Wang et al. (2000a, 2000b) and Sachs et al. (2007), most of the critical risks factors are related to government or government officers and their actions. Moreover, few specific PPP laws have been legislated in mainland China to date (Li and Wang 2006). Under these situations, a PPP model cannot be successfully implemented by a strong and good private consortium alone.

As the respondents were asked to rate the eighteen CSFs according to a Likert scale from 1 - 5 (1 = Least Important and 5 = Most Important), a value above '3' would represent that the CSF is of importance. The findings showed that all CSFs were ranked above '3' by respondents from mainland China and Hong Kong. This represents that the respondents in both administrative systems felt that all the CSFs were important to the success of PPP projects.

Also, amongst the eighteen CSFs it was found that the vast majority (i.e., fifteen) of these was rated higher by mainland Chinese respondents, only two were rated higher by respondents from Hong Kong and the remaining CSF scored equally for the two administrative systems. The CSFs that scored higher in mainland China include:

- a. Stable macro-economic condition
- b. Favorable legal framework
- c. Sound economic policy
- d. Available financial market
- e. Multi-benefit objectives
- f. Appropriate risk allocation and risk sharing
- g. Commitment and responsibility of public and private sectors
- j. Project technical feasibility

- k. Shared authority between public and private sectors
- l. Political support
- n. Well organized and committed public agency
- o. Competitive procurement process (enough potential bidders in the process)
- p. Transparency procurement process (process is made open and public)
- q. Government involvement by providing guarantee
- r. Thorough and realistic assessment of the cost and benefits

Those that scored higher in Hong Kong include:

- i. Good governance
- m. Social support

And the only CSF that scored the same for both administrative regions was:

- h. Strong and good private consortium

A closer look at the mean values showed that the two CSFs that were ranked higher by respondents from Hong Kong were only marginally higher. For 'Good governance' the Hong Kong mean value was only higher than that of mainland China by 0.08. And for 'Social support' the mean value was only higher by 0.01. Hence it can be assumed that these CSFs were ranked similarly. Therefore, in general the majority of CSFs were ranked higher by mainland Chinese respondents. Respondents from mainland China rated the CSFs from a mean value of 3.43 to 4.36, and for those from Hong Kong 3.41 to 4.06.

Insert TABLE 2 here.

5.2 Agreement of respondents within mainland China and Hong Kong

As shown in Table 3, the Kendall's coefficient of concordance (W) for the rankings of CSFs was 0.086, 0.119 and 0.061 for 'China and Hong Kong', 'China' and 'Hong Kong' respectively. The computed W's were all significant at 0.000.

As the number of attributes considered were above seven, as mentioned previously the Chi-square value would be referred to rather than the W value. According to the degree of freedom, the critical value of Chi-square was 27.590. For all three groups ('China and Hong Kong', 'China' and 'Hong Kong') the computed Chi-square values were all above the critical value of Chi-square (126.170, 107.142 and 34.045 for 'China and Hong Kong', 'China' and 'Hong Kong' respectively). Therefore the assessment by the respondents within each group on their rankings of CSFs is proved to be consistent. This finding ensures that the completed questionnaires are valid for further analysis.

Insert TABLE 3 here.

5.3 Agreement of respondents between mainland China and Hong Kong

The next stage of the analysis was to test whether there is any substantial agreement amongst the respondents from the two groups which is determined by the Spearman rank correlation coefficient (r_s) again using the SPSS statistical package. The correlation coefficient of the rankings on CSFs was 0.718 with a significance of 0.01. Therefore, the low significant value achieved concluded that there was no significant disagreement on the rankings of CSFs between respondents of the two administrative systems.

Furthermore, the independent 2-sample t-test was undertaken to examine if there was any significant difference in mean value responses between the two respondent groups for each of the eighteen CSFs discussed. When the calculated significance level is below the allowable value of 0.05 for a certain CSF, a large variation is detected between the views of the respondents from mainland China and Hong Kong. A significance level below 0.05 was used because this degree of significance has been commonly used by other researchers in similar studies. Amongst the t-test results for the eighteen CSFs between mainland China and Hong Kong respondents, three CSFs fell below a significance level of 0.05 (Table 4), the others were not statistically significant. The significance levels for these three CSFs showed that the respondents from mainland China and Hong Kong shared very different views on their importance. Although it cannot be seen obviously from the ranking patterns that these CSFs shared different views between the two respondent groups, a closer look at the mean differences proved that this was the case. The variation in mean was the greatest for 'Multi-benefit objectives', with a difference of 0.54 between the administrative regions. This finding has shown that mainland Chinese respondents ranked this CSF much more importantly than the respondents from Hong Kong. The Hong Kong government has previously been criticized for its unclear objectives. Next greatest was 'Appropriate risk allocation and risk sharing' with a mean difference of 0.49. Again mainland Chinese respondents rated this CSF higher than respondents from Hong Kong. Wang's (2001) pointed out that only very few PPP projects in mainland China could perform successfully due to the lack of an equitable risk sharing mechanism. This theory, though applicable globally, has shown to be particularly demanding in mainland China. And finally the mean difference for 'Available financial market' was 0.44. This CSF was ranked higher by the mainland Chinese respondents, indicating that they felt that an available financial market is highly important. On the other hand in Hong Kong the lower ranking of this CSF may not indicate that it is less important but instead a readily available financial market has already been taken for granted. Hong Kong being an international business hub for many years, together with its touch of Western culture instilled by the previous British ruling, has drawn international investors and businesses. Compared to mainland China, Hong Kong has appeared to provide a more predictable business environment. For the other CSF's the differences in means ranged from 0.00 to 0.34 only.

Insert TABLE 4 here.

6. Conclusions

This paper has presented the findings from a questionnaire survey conducted in both mainland China and Hong Kong to rate the importance of a list of CSFs. The top CSF ranked by respondents from both administrative systems was 'Favorable legal framework'. Other CSFs rated highly irrespective of geographical location included: 'Appropriate risk allocation and risk sharing'; 'Commitment and responsibility of public and private sectors'; and 'Stable macro-economic condition'. Ranked highly by Chinese respondents but not by those from Hong Kong included 'Available financial market'. This finding has reflected the fact that mainland China faces many more financial restrictions compared to Hong Kong. In Hong Kong, respondents ranked 'Strong and good private consortium' highly unlike the Chinese respondents. Literature has shown that there are many other risks in mainland China that may disrupt the success of PPP projects. Therefore, the successful implementation of PPP is not solely reliant on a strong and good private consortium.

The responses collected also showed that all CSFs were rated importantly for adopting PPP by both groups of respondents. The responses also indicate that the majority of the CSFs were rated higher by Chinese respondents. The Kendall's coefficient of concordance showed that the respondents within each group gave consistent answers to the ranking of the CSFs, ensuring that the completed questionnaires were valid for analysis. The Spearman rank correlation coefficient showed that no significant disagreement on the rankings of CSFs between respondents of the two respondent groups was observed. The results of the independent 2-sample t-test showed that the differences of three CSFs were statistically significant. These included: 'Multi-benefit objectives'; 'Appropriate risk allocation and risk sharing; and 'Available financial market'. These CSFs showed significant difference due to a number of reasons. Firstly, Hong Kong did not regard multi-benefit objectives that importantly. Also, previous studies have shown that mainland China is in need of a proven risk sharing mechanism. And finally as mentioned before the financial market in mainland China still faces many restrictions.

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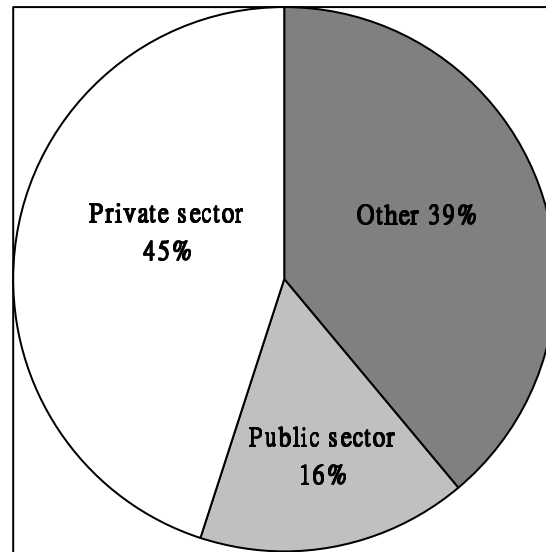


Figure 1: Background of the survey respondents

Table 1. CSFs of PPP from published literature

	Critical success factors of PPP															
	Competitive and Transparent procurement process	Project economic viability	Government guarantee	Available financial market	Clear project brief and client requirements	Business diversification	Strong private consortium	Good partners' relationship	Strong government support	Consultation with end- users	Appropriate risk allocation	Stable and transparent political/social situation	Appropriate project identification	Effective management control	Technology transfer	Total number of critical success factors from each literature
Li et al. (2005)	x	x	x	x												4
Jefferies (2006)	x				x	x										3
Abdul-Rashid et al. (2006)		x					x	x	x							4
Corbett and Smith (2006)	x	x		x	x	x	x	x	x	x						9
Zhang (2005)	x	x	x	x			x	x			x					7
El-Gohary et al. (2006)									x							1
Qiao et al. (2001)	x	x									x	x	x	x	x	7
Nijkamp et al. (2002)		x										x				2
Jamali (2004)					x				x			x	x			4
Jefferies et al. (2002)	x			x			x									3
Tam et al. (1994)		x					x	x	x			x	x	x		7
Tiong (1996)		x	x				x						x			4
Birnie (1999)							x									1
Grant (1996)											x					1
Kanter (1999)			x					x	x							3
Gentry and Fernandez (1997)	x															1
Akintoye et al. (2001)				x												1
Total number of citations for a certain CSF	7	8	4	5	3	2	7	5	6	1	3	4	4	2	1	62

Table 2. Mean scores and rankings for the CSFs of PPP

	China and Hong Kong			China			Hong Kong		
	N	Mean	Rank	N	Mean	Rank	N	Mean	Rank
a. Stable macro-economic condition	87	4.06	4	53	4.19	4	34	3.85	4
b. Favourable legal framework	87	4.24	1	53	4.36	1	34	4.06	1
c. Sound economic policy	87	3.89	7	53	3.98	8	34	3.74	7
d. Available financial market	87	3.98	5	53	4.15	5	34	3.71	8
e. Multi-benefit objectives	87	3.83	10	53	4.04	6	34	3.50	16
f. Appropriate risk allocation and risk sharing	87	4.15	2	53	4.34	2	34	3.85	5
g. Commitment and responsibility of public and private sectors	87	4.11	3	53	4.21	3	34	3.97	2
h. Strong and good private consortium	87	3.91	6	53	3.91	10	34	3.91	3
i. Good governance	87	3.63	15	53	3.60	17	34	3.68	10
j. Project technical feasibility	87	3.60	16	53	3.62	15	34	3.56	15
k. Shared authority between public and private sectors	87	3.54	17	53	3.62	15	34	3.41	18
l. Political support	87	3.87	8	53	3.94	9	34	3.76	6
m. Social support	87	3.44	18	53	3.43	18	34	3.44	17
n. Well organised and committed public agency	87	3.66	14	53	3.66	14	34	3.65	12
o. Competitive procurement process (enough potential bidders in the process)	87	3.76	11	53	3.81	12	34	3.68	9
p. Transparency procurement process (process is made open and public)	86	3.87	9	53	4.00	7	33	3.67	11
q. Government involvement by providing guarantee	87	3.75	12	53	3.83	11	34	3.62	14
r. Thorough and realistic assessment of the cost and benefits	87	3.74	13	53	3.79	13	34	3.65	13

* N = Number of survey respondents

Table 3. Results of Kendall's concordance analysis for the CSFs of PPP

	China and Hong Kong	China	Hong Kong
Number of survey respondents	86	53	33
Kendall's coefficient of concordance (W)	0.086	0.119	0.061
Chi-square value	126.170	107.142	34.045
Critical value of Chi-square	27.590	27.590	27.590
Degree of freedom (df)	17	17	17
Asymptotic significance	0.000	0.000	0.008

Table 4. Results of independent 2-sample t-test for statistically significant CSF of PPP as identified by Chinese and Hong Kong respondents

			Levene's test for equality of variances		t-test for equality of means		
			F	Significance	t	Degree of freedom	Significance (2-tailed)
d	Available financial market	Equal variances assumed	1.553	0.216	-2.499	85	0.014
		Equal variances not assumed			-2.649	82.356	0.010
e	Multi-benefit objectives	Equal variances assumed	0.838	0.363	-2.427	85	0.017
		Equal variances not assumed			-2.365	64.422	0.021
f	Appropriate risk allocation and risk sharing	Equal variances assumed	0.426	0.516	-2.281	85	0.025
		Equal variances not assumed			-2.266	68.952	0.027