



Factors contributing to successful public private partnership projects

Successful PPP projects

Comparing Hong Kong with Australia and the United Kingdom

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Abstract

Purpose – With the increasing interest in public private partnership (PPP), there is a need to investigate the factors contributing to successful delivery of PPP projects. The purpose of this paper is to analyze the perceptions of respondents from Hong Kong, Australia and the UK on the importance of 18 such factors.

Design/methodology/approach – An empirical questionnaire survey was conducted in Hong Kong and Australia. The survey respondents were asked to rate 18 factors which contribute to delivering successful PPP projects.

Findings – The findings from this survey were further compared with the results achieved by a previous researcher in a similar survey conducted in the UK. The comparison showed that amongst the top five success factors ranked by Hong Kong respondents, three were also ranked highly by the Australians and British. These success factors included: “Commitment and responsibility of public and private sectors”; “Strong and good private consortium”; and “Appropriate risk allocation and risk sharing”. Therefore, it can be concluded that there are certain common critical success factors for conducting PPP projects, irrespective of the geographical locations.

Originality/value – The findings presented in this paper have highlighted the most significant critical success factors which may be applicable to all jurisdictions, and also those which are specifically for Hong Kong and Australia. It is believed that the participants of future PPP projects can use these findings to maximize the success of conducting similar projects.

Keywords Hong Kong, Australia, United Kingdom, Partnership, Procurement, Public sector, Private sector

Paper type Research paper



1. Introduction

Public private partnership (PPP) was first introduced in the UK in 1992, 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 25-30 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 and 14 percent of Britain's total annual investment in public services. Up to 2006, 794 PFI deals had already been signed. The combined capital value was approximately £55 billion (National Audit Office, 2008). Amongst these projects almost 70 percent were in the health sector, and over 40 percent costing below £10 million (Akintoye, 2007). However, Maltby (2003) asserted that PFI should be abolished for smaller projects and for information technology schemes. 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 success factors in order to maximize the advantages of this method and to reduce the risks for all concerned parties.

2. Literature review on achieving successful PPP projects

Researchers worldwide have been keen to discover the key ingredients for delivering successful PPP projects. These findings are particularly important for those jurisdictions that are new to the concept of PPP. With the numerous research studies conducted it is sometimes difficult for jurisdictions to realize which findings are and are not applicable. To provide some general knowledge on the factors leading to successful PPP projects, this section takes a look at some of the findings derived by previous researchers.

The UK has a long history in adopting the PPP model. Consequently, there has been a large number of studies produced looking at factors leading to successful PPP projects. For example, Pinder (2004) conducted a questionnaire survey with 701 respondents in the UK involved with the PPP process. The findings highlighted four main critical success factors for conducting PPP projects including: well-drafted output specification; a robust business case; committed senior management; and full consultation with end-users. Li *et al.*'s (2005) study was also conducted in the UK at a similar time as Pinder *et al.*'s. They found both similar and dissimilar findings. The factors contributing to successful projects included: effective procurement; project implementability; government guarantee; favorable economic conditions; and available financial market.

Kwak *et al.* (2009) were also interested in looking at the factors contributing to successful PPP projects. Consequently, they analysed five relevant research studies of different jurisdictions. The findings indicated that there were four main aspects which would lead to successful PPP projects in general. These included:

- (1) the competence of the government;
- (2) the selection of an appropriate concessionaire;
- (3) an appropriate risk allocation between the public and private sectors; and
- (4) a sound financial package.

In jurisdictions that are new to delivering PPP projects, researchers found that the successful implementation requires a stable political and social environment. This environment heavily relies on the stability and capability of the host government (Wong, 2007). Political and social issues that go beyond the 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. For example, in Bangkok, the frequent change in government premiers has led to the cancellation of many new public infrastructure projects originally procured under the PPP approach (Khang, 1998; Cobb, 2005).

These studies as well as other previous studies have highlighted the importance of the government focusing on delivering an on-time and good quality project which meets the pre-agreed service benchmarks or requirements throughout the life of the contract. During the procurement process, the government should be less concerned with "how" these are achieved and should not impose undue restrictions and constraints on the private sector participants. This is to mean that 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).

Furthermore, research studies have indicated that a transparent and efficient procurement process is essential in lowering the transaction costs and shortening the time in negotiation and completing deals. 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).

Many researchers (Akintoye *et al.*, 2001; Corbett and Smith, 2006; Jefferies *et al.*, 2002; Li *et al.*, 2005; Zhang, 2005) have also found that project financing is a key success 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.

The review of relevant literature has indicated that the factors leading to successful PPP projects can vary for different jurisdictions and hence there is a need to identify those factors which are common irrespective of geographical location and also those which are specific for the jurisdiction.

3. Research methodology

3.1 Questionnaire survey

The practitioners' views on factors contributing to successful PPP projects were solicited by way of a questionnaire survey. 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. First, 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. Second, there would be no added advantage to reinvent the work that has previously been done by other researchers. And third 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, Professor Akintola Akintoye who is currently the Head of the School of Built and Natural Environment, University of Central Lancashire, UK.

3.2 Collection of research data

An empirical questionnaire survey was undertaken in Hong Kong and Australia to analyse the factors contributing to successful PPP projects. 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 success factor 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 95 target respondents in Hong Kong and 80 target respondents in Australia. 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 34 completed questionnaires from Hong Kong and 11 from Australia were returned representing response rates of 36 and 9 percent, respectively. The lower response rate in Australia was expected as the questionnaire was administered from Hong Kong, hence geographical complications were perceived. But as this study mainly focuses on Hong Kong, the responses received from Australia were used for reference only, similarly so were the results from Li's (2003) survey. It must be noted that the number of responses in Table I may not always be 34 for Hong Kong and 11 for Australia, as these respondents may not have ranked all the success factors. Also, Table II shows that only 33 and eight responses in Hong Kong and Australia, respectively, were suitable for subsequent statistical analyses.

The questionnaire respondents comprised experienced practitioners from the industry. As shown in Figures 1 and 2 approximately half of the respondents in Hong Kong and Australia possessed 21 years or above of industrial experience. Figures 3 and 4 delineate the demographic details of questionnaire respondents who have been involved with PPP projects. Given the few BOT/PPP projects conducted in Hong Kong, it was a surprise to find that approximately 40 percent of the respondents gained previous experience. Without doubt some of these may have had experience with local BOT projects or PPP projects overseas, but still the experience of these respondents confirmed the quality of the responses from the survey conducted. In addition, amongst those respondents who have acquired experience with PPP projects, 10 percent had previously been involved with at least five projects. In Australia, many more PPP projects have been conducted so it was unsurprising to find that approximately 90 percent of the respondents have participated in PPP projects before, with two-thirds

	Hong Kong			Australia			UK (Li, 2003)			Successful PPP projects
	<i>n</i>	Mean	Rank	<i>n</i>	Mean	Rank	<i>n</i>	Mean	Rank	
(a) Stable macro-economic condition	34	3.85	4	11	4.18	12	61	3.19	15	49
(b) Favorable legal framework	34	4.06	1	11	4.27	7	61	3.63	9	
(c) Sound economic policy	34	3.74	7	11	4.09	13	61	3.19	13	
(d) Available financial market	34	3.71	8	11	4.18	11	61	4.04	3	
(e) Multi-benefit objectives	34	3.50	16	10	4.20	10	61	3.19	14	
(f) Appropriate risk allocation and risk sharing	34	3.85	5	11	4.64	2	61	4.05	2	
(g) Commitment and responsibility of public and private sectors	34	3.97	2	11	4.91	1	61	3.98	4	
(h) Strong and good private consortium	34	3.91	3	11	4.64	3	61	4.11	1	
(i) Good governance	34	3.68	10	11	4.45	4	61	3.72	8	
(j) Project technical feasibility	34	3.56	15	11	4.36	5	61	3.79	6	
(k) Shared authority between public and private sectors	34	3.41	18	10	3.70	16	61	2.98	17	
(l) Political support	34	3.76	6	11	4.27	6	61	3.56	11	
(m) Social support	34	3.44	17	11	3.36	17	61	2.81	18	
(n) Well organized and committed public agency	34	3.65	12	11	4.27	8	61	3.74	7	
(o) Competitive procurement process (enough potential bidders in the process)	34	3.68	9	11	4.27	9	61	3.37	12	
(p) Transparency procurement process (process is made open and public)	33	3.67	11	11	4.09	14	61	3.6	10	
(q) Government involvement by providing guarantee	34	3.62	14	10	2.40	18	61	3.16	16	
(r) Thorough and realistic assessment of the cost and benefits	34	3.65	13	11	4.00	15	61	3.95	5	

Note: *n* = number of survey respondents

Table I.
Mean scores and rankings for the factors that contribute to the success of PPP projects

	Hong Kong	Australia	
Number of survey respondents	33	8	Table II. Results of Kendall's concordance analysis for the factors that contribute to the success of PPP projects
Kendall's coefficient of concordance (W)	0.061	0.270	
χ^2 value	34.045	36.757	
Critical value of χ^2	27.590	27.590	
Degree of freedom (df)	17	17	
Asymptotic significance	0.008	0.004	

of these respondents having participated with at least five PPP projects. Once again this reassures the value and reliability of the findings.

3.3 Tools for data analysis

3.3.1 Mean score ranking technique. Chan and Kumaraswamy (1996) adopted the "mean score" (MS) method to establish the relative importance of causes of delay in building construction projects in Hong Kong as suggested by the clients, consultants and contractors. The data collected from the current questionnaire survey was also analysed using the same technique, within various groups being categorized according

Figure 1.
Histogram showing the number of years of working experience in construction industry for the Hong Kong survey respondents

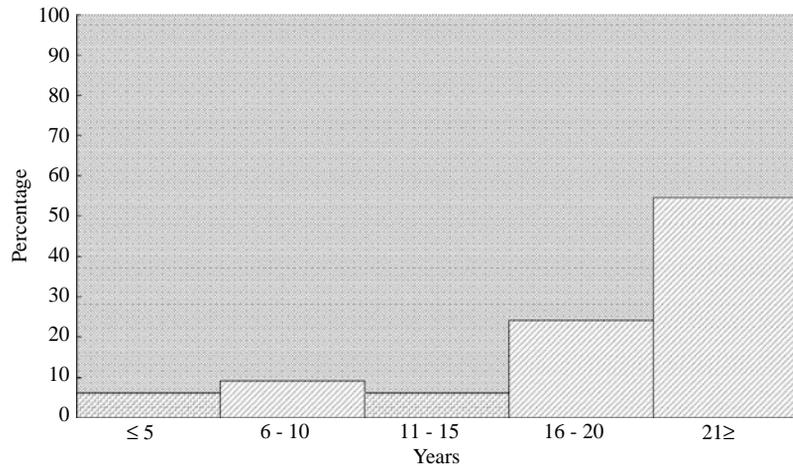
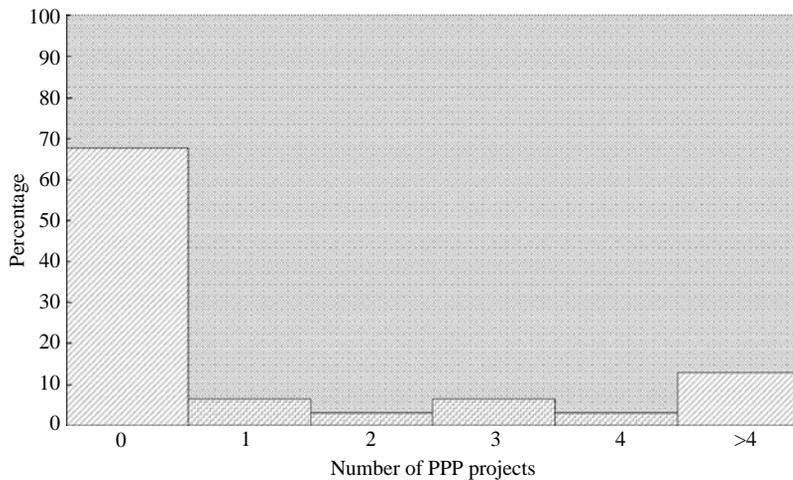


Figure 2.
Histogram showing the number of PPP projects the Hong Kong survey respondents have been involved with



to the origins of the respondents (i.e. Hong Kong and Australia). The five-point Likert scale (1 – least important and 5 – most important) as described previously was used to calculate the MS for each success factor, 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 success factors to the respondents from Hong Kong, Australia and the UK as presented in Li’s (2003) survey. The MS for each success factor was computed by the following formula:

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

where:

- s = score given to each success factor by the respondents, ranging from 1 to 5 (1 – least important and 5 – most important).

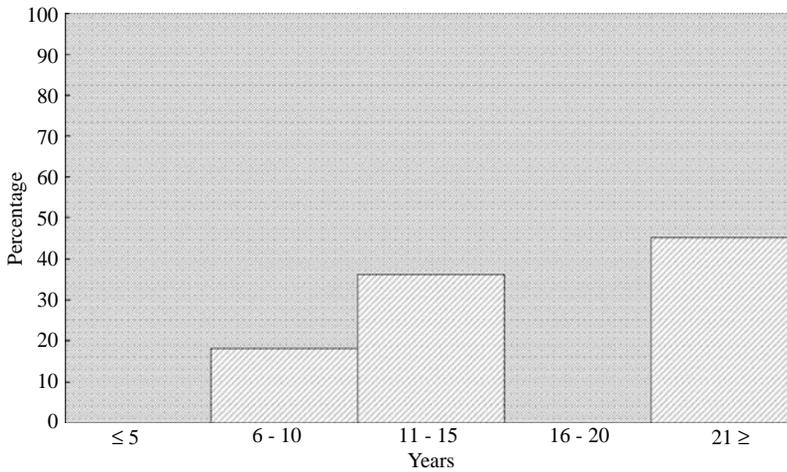


Figure 3. Histogram showing the number of years of working experience in construction industry for the Australian survey respondents

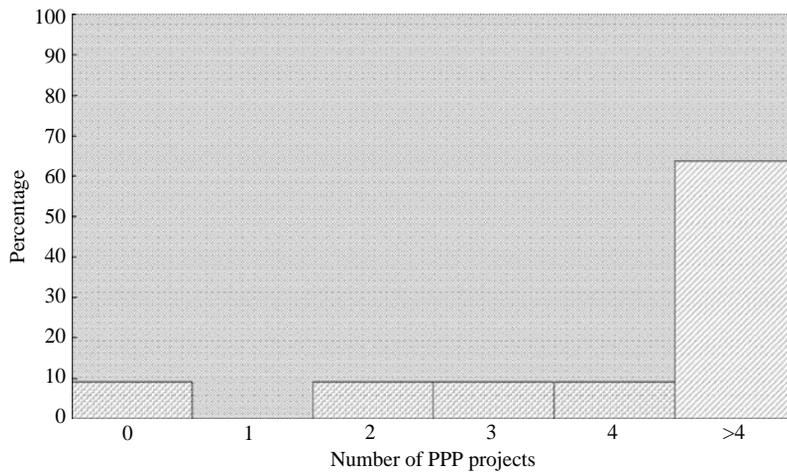


Figure 4. Histogram showing the number of PPP projects the Australian survey respondents have been involved with

f = frequency of each rating (1-5) for each success factor.

N = total number of responses concerning that success factor.

3.3.2 Kendall's concordance analysis. The survey respondents in this study were based on two groups: Hong Kong and Australia. Kendall's concordance analysis was conducted to measure the agreement of different respondents on their rankings of success factors 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 success factors was indicated. The W for the success factors 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 success factors being ranked.

\bar{R}_i = average of the ranks assigned to the *i*th success factor.

\bar{R} = the average of the ranks assigned across all success factors.

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, χ^2 is used as a near approximation instead. The critical value of χ^2 is obtained by referring to the table of critical values of χ^2 distribution, which can be found in Siegel and Castellan (1988).

4. Discussion of survey results

The factors that contribute to the success of PPP projects were assessed from different perspectives of the Hong Kong, Australia and the UK (results obtained by Li (2003) from his survey) respondent groups. The means for each administrative system were calculated and ranked in descending order of importance as shown in Table I.

4.1 Agreement of the survey respondents

As shown in Table II, the Kendall's coefficient of concordance (*W*) for the rankings of success factors that contribute to the success of PPP projects was 0.061 and 0.270 for Hong Kong and Australia, respectively. The computed *W*'s were significant with *p* = 0.008 and 0.004, respectively. As the number of attributes considered were above 7, as mentioned previously the χ^2 value would be referred to rather than the *W* value. According to the degree of freedom, the critical value of χ^2 was 27.590 for both groups (Hong Kong and Australia), the computed χ^2 values were all above the critical value of χ^2 (34.045 and 36.757, respectively). Therefore, the assessment by the respondents within each group on their rankings of success factors is proved to be consistent. This finding ensures that the completed questionnaires were valid for further analysis.

4.2 Ranking of factors that contribute to the success of PPP projects

A total of 18 success factors for adopting PPP were rated by the respondents. Figure 5 shows the relationship of the top five success factors ranked in Hong Kong with their ranking positions in Australia and the UK. These success factors included:

- favorable legal framework;
- commitment and responsibility of public and private sectors;
- strong and good private consortium;
- stable macro-economic condition; and
- appropriate risk allocation and risk sharing.

The top success factor ranked by respondents from Hong Kong was "favorable legal framework". On the contrary respondents from Australia and the UK ranked this



Figure 5.
Rank relationship between Hong Kong, Australia and the UK

success factor of medium importance only, at seventh and ninth position, respectively. This finding has implied that the Australian and British respondents were not particularly concerned about their existing legal framework, which is already well established to handle PPP projects. On the contrary, respondents in Hong Kong felt that the legal framework is the most important success factor. 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 would help to make the contracts and agreements bankable. An adequate dispute resolution system would 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. UK, Australia, Canada, South Africa, etc.) to facilitate the effective application of PPP procurement approach.

The second success factor ranked by Hong Kong respondents was “commitment and responsibility of public and private sectors”. This success factor was also ranked importantly by the Australians and British at first and fourth place, respectively. This success factor was ranked high by all respondent groups irrespective of geographical locations. 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).

Ranked third by respondents in Hong Kong and Australia was “strong and good private consortium”. Respondents from the UK felt even stronger on the importance of this success factor and ranked it top. This finding again has shown that this success factor is seen to be highly important to the success of PPP projects irrespective of geographical locations. 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 fourth success factor ranked by respondents from Hong Kong was “stable macro-economic condition”. On the contrary respondents from Australia and the UK ranked this success factor relatively low amongst the 18 success factors rated. In these countries this success factor was ranked only 12 and 15, respectively. This success factor was therefore seen as quite important in Hong Kong but rather unimportant in Australia and the UK. 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 Hong Kong. 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 the 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 to cover the project costs and earn reasonable profits and investment returns. At the same time, the government should take due consideration of the 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).

The fifth success factor ranked by Hong Kong respondents was “appropriate risk allocation and risk sharing”. Respondents from Australia and the UK both ranked this success factor second, showing again that irrespective of geographical differences all groups of respondents ranked this success factor importantly. Although so the findings showed that the respondents from Hong Kong ranked this success factor slightly below the others. This could be due to the fact the Hong Kong has had experience with different procurement systems that entail different risk allocation models, thereby making this success factor relatively less critical in terms of its contribution to project success. 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 beyond 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).

The results also found that the success factors “shared authority between public and private sectors” and “social support” were ranked in the bottom three by all groups of respondents. These success factors were therefore seen to be least important compared to the others. Although no explanation can be provided for why these success factors were ranked particularly lower, it can be assumed that the other success factors were seen to be more important. This perception was shown to be true for all survey locations.

The mean values for the success factors as rated by Hong Kong respondents ranged from 3.41 to 4.06. This observation has reflected that the variation in their responses are relatively small, only 0.65 for Hong Kong. In Australia and the UK the means ranged from 2.40 to 4.91 and 2.81 to 4.11, respectively. The corresponding differences in means were 2.51 and 1.30, respectively. The differences in means were shown to be much higher for the survey conducted in Australia and the UK compared to Hong Kong. This finding shows that the Hong Kong respondents rated the 18 success factors much more similarly, whereas in Australia and the UK the respondents showed a much larger variation.

As the respondents were asked to rate the 18 success factors according to a Likert scale from 1 to 5 (1 – least important and 5 – most important), a value above “3” would represent that the success factor is of importance. Amongst the success factors none were ranked below “3” in the Hong Kong rank. In Australia and the UK only one and two success factors, respectively, were ranked below a score of “3”. Therefore, all three groups of respondents concurred that the identified factors were important.

5. Conclusions

This paper has analysed the perceptions of respondents from Hong Kong, Australia and the UK on the importance of 18 factors contributing to successful delivery of PPP projects. The ranking in Hong Kong showed that the top five success factors included:

- (1) favorable legal framework;
- (2) commitment and responsibility of public and private sectors;
- (3) strong and good private consortium;
- (4) stable macro-economic condition; and
- (5) appropriate risk allocation and risk sharing.

The top success factor ranked by Hong Kong respondents was ranked with medium importance by respondents from the other two groups; implying that their legal frameworks are already well developed to cater for PPP projects hence they are less concerned on the existing system. The second, third and fifth success factors were ranked highly by all three groups of respondents, indicating that these success factors were applicable to delivering successful PPP projects irrespective of their geographical locations. The fourth success factor ranked by Hong Kong respondents was ranked lowly by the other groups of respondents. In Australia and the UK there is a well established stable macro-economic environment hence the market is much more predictable. Hong Kong on the other hand has experienced dramatic changes since the British to Chinese handover in 1997, hence they are still adjusting to the changes and the market is therefore not as stable. As a result a stable macro-economic condition was rated much higher by the Hong Kong respondents. In general, all three groups of respondents concurred that the identified factors were important. The findings of this research study has shown that there are certain critical success factors which can be applicable to PPP projects irrespective of their jurisdiction, whereas there are also those which are country specific. It is hoped that these findings will provide both the public and private sectors an understanding of how PPP projects can be conducted successfully. Those critical success factors highlighted to be important for all

jurisdictions can be adopted easily. For those country specific critical success factors, this survey can be repeated for those countries which have not been included in this survey easily.

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