Empirical comparison of critical success factors for public-private partnerships in developing and developed countries

A case of Ghana and Hong Kong

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Abstract

Purpose – The purpose of this paper is to investigate the similarities and differences of critical success factors (CSFs) for public-private partnership (PPP) projects in developing and developed countries, using Ghana and Hong Kong as examples.

Design/methodology/approach – An empirical questionnaire survey was conducted with experienced PPP practitioners in Ghana and Hong Kong. Survey responses were analysed using Kendall's concordance analysis, mean score ranking, quartile groupings analysis and Mann-Whitney U test.

Findings – The results indicate that a favourable legal and regulatory framework is very critical in both jurisdictions. Further, technology transfer, technological innovation, public/community participation and coordination and government providing financial support are of low importance in both jurisdictions. The non-parametric test shows that 16 CSFs are of different importance in Ghana and Hong Kong. Specifically, CSFs related to the socio-political and economic conditions of PPP projects are very critical in Ghana, whereas CSFs directly related to the organisation and relationship of PPP projects are very critical in Hong Kong.

Originality/value – The outputs of this study add to the international best practice framework for successful PPP implementation. Further, international private investors and governments who are yet to adopt the PPP concept would be considerably informed of the investment strategies to employ when engaging in PPP arrangements.

Keywords Hong Kong, Critical success factors, Ghana, Public-private partnership, Developing countries, Developed countries

Paper type Research paper

1. Introduction

Since the early 1990s, the public-private partnership (PPP) policy has been widely adopted and different types are being practiced in both developing and developed countries (Zhang, 2005a). Essentially, many governments now perceive PPP as an innovative procurement method, which combines the advantages of competitive tendering and flexible negotiation to deliver "value for money" public infrastructure and services (Chan *et al.*, 2010; Li *et al.*, 2005; Chou and Pramudawardhani, 2015; Cheung *et al.*, 2009; Akintoye *et al.*, 2003). With PPP schemes, risks are shared and allocated on an agreed basis to the party with better mitigation techniques (Xu *et al.*, 2010).

Certainly, PPP has been well practiced in most of the developed countries. For instance, over 700 PPP projects have been implemented in the UK in different infrastructure sectors (Partnerships UK, 2006; Yescombe, 2011). Likewise, 24 PPP projects with investments amount of $12.4 billion have been initiated in Victoria State of Australia (State Government of Victoria, 2015). In addition, successful projects including the Cross Harbour Tunnel (CHT), Asia World Expo, Hong Kong Disneyland Theme Park and Eastern Harbour Crossing have been recorded in Hong Kong (Tam, 1999; Cheung and Chan, 2009). Other developed countries including the USA, Spain and Canada have had impressive progress with PPP practice (Abdel Aziz, 2007;

Reinhardt, 2011). These observations are also not different in some developing countries including South Africa, China, Brazil and India (World Bank, 2015). Undeniably, the successful progress of PPP implementation in some developing and developed countries comes as a result of the continuous assessments and exploration of the prevailing critical success factors (CSFs) for PPP projects in these countries (Osei-Kyei and Chan, 2015a; Cheung, Chan and Kajewski, 2012; Abdel Aziz, 2007). This implies that certain critical conditions need to be satisfied before PPP could succeed in a country (Wibowo and Alfen, 2014). However, considering the fact that PPP has become a global concept, where private investors are engaged irrespective of their cultural background (Osei-Kyei and Chan, 2016a), there is a need to empirically assess and evaluate the differences and similarities of CSFs in developing and developed countries. This is essential because such empirical analysis will considerably inform both international investors and researchers on the international implementation approach of the PPP concept. Further, because governments in both developing and developed economies are seeking to foster economic and infrastructure collaboration using PPPs, the research outputs would enlighten practitioners on the effective measures and investment strategies to adopt to ensure successful transnational PPP arrangements.

Over the past couple of decades, a significant amount of studies on the CSFs for PPPs have been conducted from either a developing or developed country's perspective (see e.g. Li *et al.*, 2005; Cheung, Chan and Kajewski, 2012; Babatunde *et al.*, 2012; Liu and Wilkinson, 2013; Meng *et al.*, 2011; Jefferies, 2006; Jacobson and Choi, 2008; Hwang *et al.*, 2013; Chan *et al.*, 2010; Abdul-Aziz and Kassim, 2011). In addition, some past studies including Cheung, Chan and Kajewski's (2012) and Chou and Pramudawardhani's (2015) have also attempted to compare the CSFs for PPPs between countries. Though the previous related studies contribute to knowledge on the international practices of PPPs, they mostly compared using data obtained from literature or compared between developed countries. Obviously, outputs from these research studies do not provide a very reliable and accurate representation of the similarities and differences of CSFs for PPPs in developing and developed countries, considering a lot of methodological limitations (Chou and Pramudawardhani, 2015). The current paper which forms part of a broader research project that aims to develop a best practice framework for PPP implementation in Ghana drawing on international experiences (Osei-Kyei and Chan, 2016a) seeks to empirically compare the CSFs for PPP projects in developing and developed countries using Ghana and Hong Kong as examples.

In this study, a country is classified as developing, if it falls within the World Bank (2016a) classification of low- and middle-income economies. According to the World Bank (2016a), a country with a lower income economy has a gross national income (GNI) per capita of USD1,025 or less, whereas a middle-income economy has a GNI per capita between USD1,026 and USD4,035 for lower middle and a GNI per capita between USD4,036 and USD12,475 for upper middle. Also, for a country to be classified as developed, it has to fall within the World Bank's (2016a) classification of high-incomes. As mentioned by the World Bank (2016a), a country is considered as high income if it has a GNI per capita of USD12,476 or above. Essentially, the World Bank (2015) classifications were used and considered suitable for this study because countries within the low- and middle-incomes categories share similar risks and characteristics in their PPP markets. This is also same for high-income economies (Cheung, Chan and Kajewski, 2012; Cheung, Chan, Lam, Chan and Ke, 2012; Li *et al.*, 2005).

Based on the World Bank (2016b) classifications, Ghana is classified as a lower-middle-income economy because it has a GNI per capita of USD1,480 as of 2015. Ghana's PPP market shares a lot of similarities with other low- and middle-income economies in Africa, South Asia, Latin America and Caribbean (Osei-Kyei and Chan, 2016a; World Bank, 2015). In Ghana, PPP became a national policy in 2004 but failed to be operationalised due to the lack of understanding on how the policy should be implemented (Osei-Kyei and Chan, 2016b). The policy was then revitalised in 2011 by the newly elected government with an introduction

of a national policy guide. A PPP unit under the Ministry of Finance and Economic Planning was set up to ensure the implementation of the policy (Osei-Kyei and Chan, 2016b). Importantly, the economic and social benefits associated with PPP projects have been mentioned as the basic drivers for PPP implementation in Ghana. These include technology transfer and innovation, local economic and social development, quick delivery of public projects and government budgetary constraints (Osei-Kyei *et al.*, 2014).

Hong Kong is classified among the high-income economies with a GNI per capita of USD41,000 as of 2015 (World Bank, 2016b). Though, Hong Kong's PPP market is not very active as seen in other advanced countries such as the UK, Australia and Canada, there has been impressive improvements over the last two decades. Essentially, Hong Kong is not new to PPP, the concept was used in the early 1960s to develop underwater tunnels such as the CHT, Eastern Harbour Crossing and Western Harbour Crossing (Tam, 1999). Most of the past PPP projects used the build operate transfer model; however, since the early 2000s different PPP modalities particularly the design build finance operate have been used for several projects. In Hong Kong, the Efficiency Unit plays a key role in the implementation of PPPs. Some of the current projects implemented in Hong Kong include the Asia World Expo, Cyber Port Project and Hong Kong Disneyland Theme park (Shen *et al.*, 2006).

2. Review of previous studies on the CSFs for PPP projects

Rockart (1982) defined CSFs as the "few key areas of activities in which results are absolutely necessary for a manager to achieve his/her goal". Importantly, CSFs explores the basic issues in projects, which practitioners need to maintain in order to achieve success (Hardcastle *et al.*, 2005). Since the early 1990s, the CSF methodology has been extensively applied in PPP projects particularly from developing and developed countries' perspectives; some related studies are summarised in Table I.

Previous studies have highlighted political stability and support as extremely critical in achieving success in PPP project implementation in developing countries (Qiao *et al.*, 2001, 2002; Chan *et al.*, 2010; Babatunde *et al.*, 2012; Dulaimi *et al.*, 2010). On the other hand, other studies including Li *et al.* (2005) and Cheung, Chan and Kajewski (2012) pointed out the fairly importance of this CSF in the developed countries. Notwithstanding, most developing countries have very unstable political and social environments compared to countries in the developed regions. The frequent change of governments and political violence mostly lead to the cancellation and distress of PPP projects implemented in some developing countries (Cobb, 2005). Therefore, there is the need for political leaders to be fully committed and allow stability to prevail in order to ensure the successful implementation of PPP projects. In addition, if private investors are undeservedly victimised, governments should fully compensate these investors (Cheung, Chan and Kajewski, 2012).

Other researchers have also emphasised that implementing successful PPP projects in developing countries require a stable and favourable macroeconomic indicators (Qiao *et al.*, 2001; Osei-Kyei and Chan, 2015b; Ismail, 2013). The macroeconomic indicators include interest, inflation, unemployment, GDP growth and exchange rates (Harvie and Lee, 2002). These indicators particularly interest and inflation rates have to be made stable over a significant period of time to enable practitioners make accurate and reliable financial projections of PPP projects (Mladenovic *et al.*, 2013). Other very important CSFs for PPP projects in developing countries highlighted by previous studies include selecting the right project, favourable legal and regulatory framework, community support, available and mature financial market, technology transfer, trust, openness, stakeholder engagement and competitive procurement process (Askar and Gab-Allah, 2002; Qiao *et al.*, 2001; Ismail, 2013; Dulaimi *et al.*, 2010; Meng *et al.*, 2011; Osei-Kyei and Chan, 2015b; Chan *et al.*, 2010).

From the developed countries perspectives, CSFs including clear project brief and design development, appropriate risk allocation and sharing, effective procurement process,

Region	Authors	Research results/summary
Developing countries	Chan *et al.* (2010)	Political support, public/community support, transparent procurement, stable macroeconomic conditions, competitive procurement, clarity of roles and responsibilities
	Ismail (2013)	Good governance, commitment and responsibility of parties, favourable legal framework, sound economic policy and available financial market
	Babatunde *et al.* (2012)	Political support, favourable legal framework, stable macroeconomic condition, competitive procurement, appropriate risk allocation, government guarantees, detailed project planning
	Jamali (2004)	Trust, openness, fairness, transparent procurement, competitive procurement, good feasibility studies
	Askar and Gab-Allah (2002)	Selecting right project, competitive financial proposal, stakeholder engagement, special features of bid
	Dulaimi *et al.* (2010)	Political support, strong private consortium, public/community support, favourable legal framework, stable macroeconomic condition, technology innovation, good feasibility studies
	Liu and Wilkinson (2013)	Stable macroeconomic condition, strong private consortium, private sector innovation, government guarantees, streamlined approval process, robust tendering
	Abdul-Aziz and Kassim (2011)	Political support, competitive procurement, open and constant communication, detailed project planning, compatibility skills of both parties, realistic projections
	Meng *et al.* (2011)	Competition, reliable service delivery, employment of professional advisors, open and constant communication, appropriate risk allocation, transparent procurement
Developed countries	Ozdoganm and Birgonul (2000)	Political support, financial capabilities of the private sector, government guarantees, available and mature financial market, sound economic policy
	Li *et al.* (2005)	Strong and good private consortium, available financial market, appropriate risk allocation, good feasibility studies
	Jefferies (2006)	Streamline of approval process, clear project brief and client outcomes, competition, appropriate risk allocation, public/community support, detailed project planning, long-term demand for project
	Hwang *et al.* (2013)	Transparent procurement, favourable legal framework, proper risk allocation and sharing, good governance, well-organised agency
	Jefferies *et al.* (2002)	Environmental impact of project, appropriate risk allocation and sharing, strong private consortium, public/community support, good feasibility studies
	Cheung, Chan and Kajewski (2012)	Appropriate risk allocation and sharing, favourable legal framework, strong private consortium, public/community support, good feasibility studies
	Ng *et al.* (2012)	Reliable service delivery, long-term demand for project, strong private consortium, alignment with government objectives, acceptable level of tariffs
	Jacobson and Choi (2008)	Commitment, open communication, trust, respect, community outreach, political support, clear roles and responsibilities, risk awareness
	Tang *et al.* (2012)	Clear goals and objectives, adequate time for briefing, identification of client requirement, long-term demand, open and effective communication
	Tang and Shen (2013)	Open and effective communication, knowledge of consultants, openness and trust, skill guidance and advice from project managers, clarity of roles and responsibilities
	Abdel Aziz (2007)	Availability of a PPP legal framework and implementation units, perception of the private finance objectives, risk allocation consequences, value-for-money objectives
	Gannon and Smith (2011)	Achieving balance between political PPP ideology, level of transparency and commitment, political support, market acceptance of model
	Nisar (2013)	Project must be aligned with project parties' business and service plan, appropriate management structures and procedures
	Dixon *et al.* (2005)	A robust business case, well-drafted output specification, term financial viability, risk transfer, good communication between parties, commitment

Table I.
Summary of studies
on the CSFs for PPP
from developing and
developed countries'
perspectives

long-term demand, strong private consortium, clear goals and objectives, environmental impact of projects, consistent project monitoring and minimising contract variations at operational stages have been highlighted as the key success ingredients for delivering PPP projects (Tiong *et al.*, 1992; Qiao *et al.*, 2002; Li *et al.*, 2005; Tang *et al.*, 2012; Hwang *et al.*, 2013; Ng *et al.*, 2012; Abdel Aziz, 2007; Jacobson and Choi, 2008; Jefferies, 2006).

Obviously, considering the differences in cultures and socio-political settings between developing and developed countries, the importance of some CSFs for PPP projects could significantly differ whereas others could be similar. However, this belief has not yet been proven empirically using the same set of questionnaire. Thus, this study seeks to bridge this knowledge gap and further expand understanding on the international implementation approach of PPP practices.

3. Research methodology

3.1 Prior literature and pre-testing
A comprehensive review of CSFs for PPP projects was previously conducted by authors and a checklist of CSFs for PPPs was derived (see Osei-Kyei and Chan, 2015a). To further ascertain the appropriateness of the generated list of factors with respect to their applicability in Ghana and Hong Kong, the questionnaire template was sent to six PPP experts with adequate industrial and/or academic experiences for review and pre-testing; four from Ghana and two from Hong Kong. The experts confirmed the applicability of the generated CSFs but suggested few modifications in the naming of some CSFs; Table II shows the set of CSFs for PPP projects.

3.2 Respondent selection
Respondents were selected on the basis of a two-stage sampling approach (Osei-Kyei and Chan, 2016a). First, a purposive sampling method with pre-defined criteria was employed to identify initial prospective respondents. The pre-defined criteria were as follows: respondent should have in-depth knowledge on the general practice of PPP and must have followed very closely to the development of PPP in Ghana or Hong Kong and respondent should have adequate direct hands-on working (at least one project) or research experience in PPP project delivery in Ghana or Hong Kong (Osei-Kyei and Chan, 2016a). Respondents who meet these pre-defined criteria were deemed suitable to offer reliable and useful experience on the practice of PPP in Ghana or Hong Kong.

In the second stage, the identified respondents were opportunistically asked to suggest potential colleagues who may be interested to contribute to the research study (Cheung, Chan and Kajewski, 2012). Majority of the suggested prospective participants willingly accepted to participate in the study and were included in the final list of respondents (Osei-Kyei and Chan, 2016a).

3.3 Questionnaire survey
An empirical questionnaire survey was conducted in both Ghana and Hong Kong on targeted PPP respondents from May 2015 to April 2016 (Osei-Kyei and Chan, 2016a). The questionnaire required respondents to rate the importance of each CSF for PPP projects as applied in their respective jurisdiction on a five-point Likert scale (i.e. 1 = least important, 2 = fairly important, 3 = important, 4 = very important and 5 = extremely important). In total, 207 potential respondents from the academic and industrial sectors were sourced and identified from dedicated private organisations, public institutions/agencies that have expressed strong interest in PPP projects (e.g. Ghana (Public Investment Division, Ghana Highways Authority, Department of Urban Roads, Ghana Ports and Harbours Authority, Local Government departments, Ghana Water Company Limited and Public Procurement Authority); Hong Kong

CSFs for PPP projects	Mladenovic et al (2013)	Liu and Wilkinson (2013)	Ng et al (2012)	Abdul-Aziz and Kassim (2011)	Jamali (2004)	Jacobson and Choi (2008)	Meng et al (2011)	Tang et al (2012)	Askar and Gab-Allah (2002)	Hwang et al (2013)	Tang and Shen (2013)	Raisbeck and Tang (2013)	Li et al (2005)	Gannon and Smith (2011)
Appropriate risk allocation and sharing	X					X	X			X			X	
Strong private consortium		X	X										X	
Political/Government support				X		X				X			X	X
Public/Community support						X							X	X
Transparent PPP process	X				X			X		X	X		X	X
Favourable legal and regulatory framework	X				X					X			X	
Stable macroeconomic indicators	X	X												
Competitive tendering process	X			X			X							
High level of enthusiasm and willingness					X		X			X		X	X	
Clarity of roles and responsibilities	X		X		X	X	X	X						
Technology innovation		X												
Open and frequent communication			X		X		X			X				
Detailed project planning	X			X		X								

Table II.
CSFs for PPP projects

Table II.

Government providing guarantees		×		×						
Right project identification							×			
Long-term demand for the project	×			×		×				
Clear project brief and design development			×		×				×	×
Political stability	×		×							
Mature and available financial market									×	×
Reasonable user fee charges			×							
Streamline approval process		×								
Choosing the right private consortium										
Sound economic policies								×		×
Well organised and committed public agency				×			×			
Clear goals and mutual benefit objectives			×		×		×			
Employment of competent transaction advisors				×	×					
Reliable service delivery			×		×		×			
Environmental impact of project										

Table II.

(continued)

CSFs for PPP projects	Ozdoganm and Birgomul (2000)	Nisar (2013)	Dulaimi et al. (2010)	Zhang (2005a)	Tiong et al (1992)	Tiong (1996)	Zhang (2005b)	Jefferies et al. (2002)	Jefferies (2006)	Babatunde et al. (2012)	Cheung, Chan and Kajewski (2012), Cheung, Chan, Lam, Chan and Ke (2012)	Chan et al. (2010)	Kumaraswamy and Morris (2002)	Cheung (2009)
Existence of a PPP project champion														
Government providing financial support														
Technology transfer														
Public/community participation and coordination														
Appropriate risk allocation and sharing		X	X	X		X		X	X	X	X			
Strong private consortium		X	X	X	X	X		X			X			
Political/ government support	X		X	X						X		X		
Public/ community support				X				X	X			X	X	
Transparent PPP process												X		
Favourable legal and regulatory framework			X							X	X	X		
Stable macroeconomic indicators			X	X						X	X	X		
Competitive tendering process									X	X		X		

Table II.

Success factor							
High level of enthusiasm and willingness					X		
Clarity of roles and responsibilities							X
Technology innovation	X		X	X			X
Open and frequent communication							
Detailed project planning			X			X	
Government providing guarantees	X					X	X
Right project identification			X	X	X		
Long-term demand for the project	X						
Clear project brief and design development						X	
Political stability		X				X	
Mature and available financial market			X			X	
Reasonable user fee charges			X	X		X	
Streamline approval process			X	X		X	
Choosing the right private consortium		X				X	
Sound economic policies	X					X	
Well organised and committed public agency							

(continued)

Clear goals and
mutual benefit
objectives
Employment of
competent
transaction advisors
Reliable service
delivery
Environmental
impact of project   X   X   X
Existence of a PPP
project champion
Government
providing financial
support
Technology transfer   X
Public/community   X
participation and
coordination

Source: Osei-Kyei and Chan (2015a)

Table II.

(Efficiency Unit, Highways Department, Housing Department, Civil Engineering and Development Department, Architectural Services Department and Hospital Authority)) and PPP-related publications focussed on Ghana or Hong Kong in peer-reviewed academic journals, conferences and books (Osei-Kyei and Chan, 2016a).

Out of the total respondents identified, 120 came from Ghana, whereas 87 came from Hong Kong. The large number of respondents identified in Ghana is because in recent years more public institutions/agencies have introduced many PPP projects, thus many people are involved with PPP practice in Ghana compared to Hong Kong. In addition, the population size in Ghana (i.e. 26.79 million as of 2014) is much higher than Hong Kong (7.24 million as of 2014) (World Bank Group, 2015; Osei-Kyei and Chan, 2016a), therefore there is a tendency of identifying more potential PPP practitioners in Ghana compared to Hong Kong (Chan *et al.*, 2010). Questionnaires were administered to targeted respondents either by face to face (i.e. for majority of questionnaires distributed in Ghana) or e-mails (i.e. for majority of the questionnaires distributed in Hong Kong). For those questionnaires sent through e-mails, instructions were given for an option of responding through the "Survey Monkey" online questionnaire platform. The alternative approach enabled experts to respond using their preferred means which increased the number of responses received.

A total of 103 completed questionnaires were received; 77 from Ghana and 26 from Hong Kong representing response rates of 64.17 and 29.89 per cent, respectively. The higher response rate in Ghana was anticipated considering that majority of the questionnaires were administered by face to face, which always yields favourable response rate compared to telephone and online surveys (Aquilino, 1994; Szolnoki and Hoffmann, 2013; Ameyaw and Chan, 2015; Osei-Kyei and Chan, 2016a). Notwithstanding, the overall sample size of 103 is considered adequate and significant for further analysis when compared with previous related studies (see e.g. Liu *et al.*, 2016 (57 responses; 32 from China, 25 from Australia); Cheung *et al.*, 2009; Cheung, Chan and Kajewski, 2012 (45 responses; 34 from Hong Kong, 11 from Australia) (Osei-Kyei and Chan, 2016a).

Table III shows the background information of respondents (Osei-Kyei and Chan, 2016a). As observed from the table, almost 62 per cent of respondents from Ghana have more than six years of PPP experience compared to 65 per cent of respondents from Hong Kong. This suggests that respondents from Hong Kong are more exposed to PPP practices compared to respondents from Ghana.

This is very unsurprising because Hong Kong's PPP market has been very active for the past two decades compared to Ghana's PPP market, which is still at an infancy stage.

Characteristics	Ghana No. of respondents	Per cent	Hong Kong No. of respondents	Per cent
Sector of PPP				
Academic	15	19.50	6	23.10
Public	35	45.50	12	46.20
Private	27	35.10	8	30.80
Total	77	100	26	100
Years of industrial and/or research experience				
5 and below	29	37.70	9	34.6
6-10	33	42.90	6	23.1
11-15	9	11.70	7	26.9
16-20	5	6.50	1	3.8
21 and above	1	1.30	3	11.5
Total	77	100	26	100
Source: Osei-Kyei and Chan (2016a)				

Table III.
Background information of respondents

Notwithstanding, considering that majority of respondents have more than six years of experience in PPPs in their respective countries renders the richness and authenticity of the survey responses from both jurisdictions.

3.4 Statistical analysis methods adopted
The Statistical Package for Social Science 21.0 was used to perform statistical tests including Kendall's coefficient of concordance (W), mean score analysis and Mann-Whitney U test. The Kendall's concordance analysis was conducted to determine the degree of consensus on the survey data in each group (Cheung and Chan, 2011). This analysis was conducted because different respondents from different sectors (i.e. public, private and academic sectors) participated in the survey, thus it is vital to test the degree of consistency among responses in each respondent group (i.e. Ghana and Hong Kong) (Osei-Kyei and Chan, 2016a). The mean score analysis was performed to assess the relative importance of each CSF for PPP projects and formed the basis for rankings. Further, the CSFs were grouped into quartiles for each jurisdiction based on the mean values. This was necessary to identify the similarities in ranking by the two respondent groups. Mann-Whitney U test was also conducted to determine whether any significant differences exist on the rankings of factors among the two jurisdictions. The Mann-Whitney U test is a non-parametric test used to study the association of ordinal (rank order) data with two independent samples (Chan *et al.*, 2011). This test tool is considered appropriate for this study because of the unequal sample sizes of the two independent groups (Ghana and Hong Kong); more importantly, the data set is not assumed to follow any distribution pattern (Sheskin, 2011; Osei-Kyei and Chan, 2016a). The statistical test was performed with a pre-defined significance level of 0.05. Thus, a p-value of a CSF less than 0.05 implies a significant difference in the perception of the respondents from Ghana and Hong Kong and vice versa.

4. Results and discussion
4.1 Agreement and consistency of responses
Table IV shows the results of the Kendall's concordance analysis at a pre-defined significance test value of 0.05. The W value obtained for each group is 0.310 (Ghana) and 0.534 (Hong Kong), with both groups of respondents obtaining a significance value of 0.00. However, because the number of attributes exceeds seven, the χ^2 is rather referred to than the computed W values (Cheung and Chan, 2011). As presented in Table IV, the critical value of χ^2 is 44.985 for the two groups. This is less than the computed χ^2 value for each group (i.e. 740.801 and 430.236 for Ghana and Hong Kong, respectively); thus, the assessment by respondents in each group is proved to be consistent. This finding reaffirms authenticity and validity of the survey responses for further analysis.

4.2 Mean ranking and quartile groupings of CSFs for PPP projects in Ghana and Hong Kong
Table V shows the mean score analysis of CSFs for PPP projects in Ghana and Hong Kong. In situation where the mean values of two or more CSFs are the same, the one with lower

Characteristics	Ghana	Hong Kong	Ghana and Hong Kong
Number of survey respondents (n)	77	26	103
Kendall's coefficient of concordance (W)	0.310	0.534	0.24
χ^2	740.801	430.236	765.44
df	31	31	31
Critical value of χ^2	44.985	44.985	44.985
Asymp. sig.	0.000	0.000	0.000

Table IV.
Results of Kendall's concordance analysis

CSFs for PPPs	Ghana			Hong Kong			Ghana and Hong Kong		
	Mean	σ	Rank	Mean	σ	Rank	Mean	σ	Rank
Favourable legal and regulatory framework	4.53	0.50	2	4.65	0.56	2	4.56	0.52	1
Transparent PPP process	4.69	0.47	1	2.96	0.82	25	4.25	0.95	2
Clarity of roles and responsibilities among parties	4.39	0.52	4	3.69	0.55	11	4.21	0.60	3
Political stability	4.43	0.50	3	3.58	0.64	14	4.21	0.65	4
Appropriate risk allocation and sharing	3.70	0.80	10	4.73	0.45	1	3.96	0.85	5
Right project identification	4.00	0.78	5	3.38	0.57	19	3.84	0.78	6
Political/Government support	3.91	0.67	6	3.54	0.65	15	3.82	0.68	7
Detailed project planning	3.75	0.71	9	3.92	0.48	7	3.80	0.66	8
Choosing the right private consortium	3.47	0.94	19	4.62	0.57	3	3.76	0.99	9
High level of enthusiasm and willingness from parties	3.66	0.74	11	3.73	0.53	10	3.68	0.69	10
Clear project brief and design development	3.57	0.79	15	3.96	0.53	6	3.67	0.75	11
Mature and available financial market	3.64	0.78	12	3.62	0.64	13	3.63	0.74	12
Reliable service delivery	3.56	0.77	16	3.77	0.65	9	3.61	0.74	13
Clear goals and mutual benefit objectives	3.39	0.73	22	4.12	0.52	5	3.57	0.75	14
Open and frequent communication among stakeholders	3.60	0.80	14	3.50	0.51	16	3.57	0.74	15
Well organised and committed public agency/department	3.61	0.71	13	3.46	0.71	17	3.57	0.71	16
Strong private consortium	3.25	0.80	27	4.50	0.51	4	3.56	0.91	17
Competitive tendering process	3.83	0.83	7	2.42	0.90	31	3.48	1.05	18
Employment of competent transaction advisors	3.51	0.72	18	3.31	0.84	21	3.46	0.75	19
Reasonable user fee charge	3.31	0.80	25	3.85	0.61	8	3.45	0.79	20
Long-term demand for the project	3.38	0.87	23	3.65	0.69	12	3.45	0.84	21
Sound economic policies	3.52	0.75	17	3.23	0.59	22	3.45	0.72	22
Stable macroeconomic indicators	3.77	0.76	8	2.35	0.75	32	3.41	0.97	23
Environmental impact of project	3.40	0.85	21	3.19	0.49	23	3.35	0.78	24
Streamline of approval process	3.34	0.74	24	3.35	0.69	20	3.34	0.72	25
Public/community support	3.13	0.85	29	3.42	0.58	18	3.20	0.80	26
Government providing guarantees	3.42	0.83	20	2.46	0.76	30	3.17	0.91	27
Technology transfer	3.30	0.90	26	2.73	0.60	28	3.16	0.87	28
Technological innovation	3.19	0.89	28	2.62	0.70	29	3.05	0.88	29
Existence of a PPP project champion	2.95	0.76	31	3.12	0.65	24	2.99	0.73	30
Public/Community participation and coordination	2.97	0.67	30	2.77	0.51	27	2.92	0.64	31
Government providing financial support	2.52	1.01	32	2.81	0.63	26	2.59	0.93	32

Table V.
Mean score ranking of CSFs for PPP projects in Ghana and Hong Kong

standard deviation is ranked higher (Field, 2013). From the table, it is observed that the mean values of CSFs for the two jurisdiction range between 2.52 and 4.69 (Ghana) and 2.35 and 4.73 (Hong Kong). The total variations in responses are 2.17 and 2.38 for Ghana and Hong Kong, respectively. Clearly, these outputs indicate that respondents from Ghana rated the CSFs more similarly than Hong Kong respondents. Further, in Ghana's ranking 18 CSFs emerged as important (i.e. mean values ⩾3.50), whereas in Hong Kong's ranking, 16 CSFs emerged as important. This implies that respondents from Ghana generally perceived the set of CSFs as more relevant to PPP projects' implementation in Ghana compared to Hong Kong respondents.

Table VI presents the quartile groupings (i.e. upper and lower quartiles) of CSFs for each jurisdiction. The upper quartile subset contains the 25 per cent highest mean values of CSFs for PPP projects, whereas the lower quartile subset consists of 25 per cent lowest mean values of CSFs. The cutoff values (i.e. hinges) for the upper quartile subset are 3.76 and 3.83 for Ghana and Hong Kong, respectively. Also, the lower quartile cutoff values are 3.32 (Ghana) and 3.00 (Hong Kong).

The upper quartile subsets of both Ghana and Hong Kong contain eight CSFs, with mean values ranging from 3.77 to 4.69 and 3.85 to 4.73, respectively. Interestingly, only one CSF (i.e. favourable legal and regulatory framework) appeared in both countries' upper quartile subsets; and also this CSF happens to be the only one with the same ranking position (i.e. second) between the two respondent groups. The findings are in line with a previous study conducted by Cheung, Chan and Kajewski (2012), where favourable legal and regulatory framework was identified as very significant towards achieving PPP projects' success in

Quartiles	Ghana CSFs for PPPs	Mean	Hong Kong CSFs for PPPs	Mean
Upper quartile $(Q_3)_{Ghana} = 3.76$ $(Q_3)_{HK} = 3.83$	Transparent PPP process	4.69	Appropriate risk allocation and sharing	4.73
	Favourable legal and regulatory framework	4.53	Favourable legal and regulatory framework	4.65
	Political stability	4.43	Choosing the right private consortium	4.62
	Clarity of roles and responsibilities among parties	4.39	Strong private consortium	4.50
	Right project identification	4.00	Clear goals and mutual benefit objectives	4.12
	Political/Government support	3.91	Clear project brief and design development	3.96
	Competitive tendering process	3.83	Detailed project planning	3.92
	Stable macroeconomic indicators	3.77	Reasonable user fee charge	3.85
Lower quartile $(Q_1)_{Ghana} = 3.32$ $(Q_1)_{HK} = 3.00$	Reasonable user fee charge	3.31	Transparent PPP process	2.96
	Technology transfer	3.30	Government providing financial support	2.81
	Strong private consortium	3.25	Public/Community participation and coordination	2.77
	Technological innovation	3.19	Technology transfer	2.73
	Public/Community support	3.13	Technological innovation	2.62
	Public/Community participation and coordination	2.97	Government providing guarantees	2.46
	Existence of a PPP project champion	2.95	Competitive tendering process	2.42
	Government providing financial support	2.52	Stable macroeconomic indicators	2.35

Note: Quartiles cutoff values are calculated using the Quartile function in MS Excel

Table VI.
Quartile groupings of CSFs for PPP projects

Hong Kong. Also Abdel Aziz (2007) indicated the importance of available legal and regulatory framework in the successful implementation of PPP projects in developed countries including the USA. Therefore, the results of this study confirm that favourable legal framework is very critical for PPP projects' success irrespective of geographical and cultural differences.

Importantly, most developing countries including Ghana do not have well-established regulations specifically for PPP arrangements. Although, some governments in developing countries including the Government of Ghana (GoG) have introduced a policy guideline for PPP practice (Ministry of Finance and Economic Planning, 2011); certainly this is not enough to enable legal transparency in PPP arrangements because of the high rate of political influences in public transactions in developing countries (Ho, 2006). As reported by Cheung, Chan, Lam, Chan and Ke (2012), one of the key problems encountered by the Xiang-Jin Expressway located in the Hubei province of China was the poor legal structure and mechanism, which allowed officials to engage in fraudulent acts. The establishment of a well-defined PPP law would facilitate a partnership, which is free of intimidations by public officials. In essence, when there is a PPP law, disputes are more likely to be settled properly compared to when a policy guideline is in place.

In Hong Kong and many other developed countries, favourable legal framework is also critical for PPP projects success (Hwang *et al.*, 2013). Although such countries may have good existing legal mechanism for public partnerships and concessions, certain additional legal conditions are required for PPP projects success. For example, Abdel Aziz (2007) mentioned some specific conditions which need to be captured in PPP acts and regulations for developed countries; these include the authorisation of the use of tolls and specific PPP modalities, limit to private sector freedom in toll settings, public evaluation of financing mechanism and the use of PPP for a specific period of time.

In the lower quartile subsets, technology transfer, technological innovation, government providing financial support and public/community participation and coordination are the CSFs which fall within each jurisdiction's subsets. Technology transfer and technological innovation are ranked 26th and 28th by the respondents from Ghana, respectively. Similarly the Hong Kong respondents ranked them 28th and 29th, respectively. This clearly shows that respondents from Ghana rated these CSFs slightly higher than the Hong Kong respondents. Unlike Hong Kong, Ghana and many developing countries heavily rely on foreign investors for PPP investments (Dulaimi *et al.*, 2010). This is primarily because of the huge investment capital required for PPP arrangements. More importantly, many locally based investors do not have the capacity to compete with foreign investors. Therefore, the transfer of technology and innovation from these foreign firms to local practitioners is necessary in PPP arrangements. But that notwithstanding, the results still show that these CSFs are not among the very important CSFs in Ghana and Hong Kong, and they are of very low significance particularly in Hong Kong.

Government providing financial support is ranked 32nd and 26th by respondents from Ghana and Hong Kong, respectively. It scored very low mean values by both jurisdictions. This is not very surprising because many governments in developing countries including the GoG do not have the available funds to support PPP arrangements. Essentially, governments in developing countries engage in PPP transactions in order to tap the private sector's capital and expertise (Osei-Kyei *et al.*, 2014). Thus, they have very little financial commitments in PPP projects compared to the private investor. Similarly, in Hong Kong and other developed countries, governments hardly commit themselves financially in PPP projects except for special types of PPP projects. The reason is that the developed countries have a good and mature financial market, where every investor could raise substantial funds for PPP investments. Emphatically, it is always easier for private investors to raise capital for PPP investments in the developed countries such as Hong Kong compared to developing countries like Ghana.

Public/community participation and coordination is also ranked similarly by respondents from Ghana and Hong Kong (i.e. 30th (Ghana) and 27th (Hong Kong)).

It scored very low mean values by both jurisdictions. The Efficiency Unit (2008) in Hong Kong has already mentioned that it is a requirement for public authorities to engage the community prior to the implementation of PPP projects. In this regard, several consultations and meetings with the general public are done by public authorities before PPP projects are implemented in Hong Kong. For example, before the implementation of the Asia World Expo PPP project in Hong Kong, series of consultations were done with the general public (Hayllar, 2010). The basic reason was to make the general public feel part of the project development. This was also intended to boost demand after completion; therefore, it was unsurprising that by the end of 2009, the Asia World Expo (2010) PPP project has contributed almost HKD9 billion to Hong Kong's economy. Similarly, this CSF is of low importance in Ghana and many other developing countries because majority of contracting authorities often engage and seek the concerns of the general public before implementing PPP projects. This is basically an international best practice for PPPs therefore contracting authorities in developing countries already carefully observe such practice.

4.3 Significant differences on the rankings of CSFs for PPP projects among respondents from Ghana and Hong Kong
As previously mentioned, the significant difference in the ranking of factors among respondents from Ghana and Hong Kong was determined using the Mann-Whitney U test. The test was conducted with the null hypothesis that no significant difference exists in the perception of respondents from Ghana and Hong Kong at a significance level of 0.05 (95 per cent confidence interval). A CSF with p-value less than 0.05 rejects the null hypothesis, signifying that the Ghanaian and Hong Kong respondents view the importance of that factor differently and vice versa.

Table VII shows the significant test results. It is noticeable that out of the 32 CSFs, 16 are significantly different, with p-values less than 0.05. Clearly, this confirms the uniqueness and distinct characteristics of PPP markets in developing and developed countries, represented by Ghana and Hong Kong. Further, the results suggest that different strategic measures and procedures are required to achieve PPP project success in developing and developed countries, thus certain PPP practices in the developed countries may not equally be applicable in developing countries. The Ghanaian respondents ranked political/ government support and political stability, 6th and 3rd, respectively; whereas the Hong Kong respondents ranked them 15th and 14th. Unlike, Ghana and many other developing countries, the PPP concept has received strong political will and support from the Hong Kong Government over the past two decades.

Most at times the Hong Kong Government support and commit into certain PPP projects financially. For example, in the Hong Kong Disneyland Theme Park PPP project, the Hong Kong Government invested HKD3.25 billion owing 57 per cent shares in the joint venture company, whereas Disney Company invested HKD2.45 billion with 43 per cent shares (Esty, 2001). In other tunnel projects such as the CHT, the Hong Kong Government owned 20 per cent shares of the Project Company (Tam, 1999). Aside the financial commitments, the Hong Kong Government had introduced several editions of comprehensive policy guidelines and funded several research studies on how best the PPP policy could be implemented in Hong Kong (Cheung, Chan and Kajewski, 2012; Efficiency Unit, 2008). These are clear indication of the existing Government support towards the PPP concept in Hong Kong. Similarly, the political environment in Hong Kong is considerably stable, with no political violence and agitations during upcoming elections compared to developing countries such as Ghana. In essence, it is important for Ghana and other developing countries to adopt some of the strategies employed by the Hong Kong Government towards showing commitment and support for the PPP concept.

CSFs for PPPs	Ghana Mean rank	Hong Kong Mean rank	U statistic	Z	p-Value
Political/Government support	55.64	41.21	720.50	−2.39	0.02*
Political stability	60.29	27.46	363.00	−5.39	0.00*
Transparent PPP process	63.56	17.75	110.50	−7.41	0.00*
Competitive tendering process	61.32	24.40	283.50	−5.70	0.00*
Existence of a PPP project champion	50.24	57.21	865.50	−1.14	0.25
Favourable legal and regulatory framework	50.16	57.46	859.00	−1.25	0.21
Government providing guarantees	59.58	29.54	417.00	−4.69	0.00*
Well organised and committed public agency/department	53.89	46.40	855.50	−1.22	0.22
Mature and available financial market	52.27	51.21	980.50	−0.17	0.86
Sound economic policies	54.84	43.58	782.00	−1.82	0.07
Stable macroeconomic indicators	62.23	21.71	213.50	−6.26	0.00*
Government providing financial support	48.94	61.06	765.50	−1.90	0.06
Technological innovation	56.72	38.02	637.50	−2.95	0.00*
Technology transfer	57.21	36.56	599.50	-3.24	0.00*
Public/Community participation and coordination	54.05	45.92	843.00	−1.46	0.15
Public/Community support	49.01	60.85	771.00	−1.92	0.06
Environmental impact of project	54.18	45.54	833.00	−1.38	0.17
Clear project brief and design development	48.26	63.08	713.00	−2.40	0.02*
Reliable service delivery	50.19	57.35	862.00	−1.15	0.25
Employment of competent transaction advisors	53.97	46.17	849.50	−1.26	0.21
Choosing the right private consortium	43.13	78.27	318.00	−5.45	0.00*
Reasonable user fee charge	47.17	66.31	629.00	−3.06	0.00*
Streamline of approval process	52.08	51.75	994.50	−0.06	0.96
Long-term demand for the project	48.92	61.12	764.00	−1.94	0.05
Right project identification	57.72	35.06	560.50	−3.60	0.00*
Detailed project planning	50.31	57.00	871.00	−1.14	0.26
Strong private consortium	41.87	82.00	221.00	−6.27	0.00*
Appropriate risk allocation and sharing	42.96	78.77	305.00	−5.65	0.00*
Clear goals and mutual benefit objectives	44.82	73.25	448.50	−4.56	0.00*
High level of enthusiasm and willingness from parties	51.17	54.46	937.00	−0.56	0.58
Open and frequent communication among stakeholders	53.01	49.00	923.00	−0.65	0.52
Clarity of roles and responsibilities among parties	59.26	30.50	442.00	−4.86	0.00*

Note: *Significant level (0.05) 95% confidence interval

Table VII.
Results of Mann-Whitney U test of CSFs for PPP projects among respondents

Transparent PPP process and competitive tendering process are observed to have significant differences between the two groups of respondents. Specifically, transparent PPP process is ranked 1st in Ghana, whereas in Hong Kong it is ranked 25th. Also, competitive tendering process is positioned 7th and 31st by respondents from Ghana and Hong Kong, respectively. This result is unsurprising because generally transparency and competition in public procurements are major concerns to most civil society groups in Ghana and other developing countries. Essentially, there is little information with respect to the financial arrangements of public construction projects including PPP projects by the general public. In the Lekki toll road project in Nigeria, Osei-Kyei and Chan (2015b) reported that most of the problems encountered in the project resulted from the lack of transparency and competition in the procurement of the project. Unlike Ghana and other developing countries, Hong Kong ensures transparency and competition throughout the PPP process. Information regarding the financial arrangements and the project parties' responsibilities are always publicly available through the media. Notwithstanding, in Hong Kong, the Independent Commission Against Corruption (ICAC) plays a critical role in public procurement towards ensuring transparency

and competition. The corruption prevention department of the ICAC monitors the progress of PPP arrangements from the initial to the completion stages, making sure that there is no conflict of interest. Ideally, Ghana and other developing countries, particularly countries in Sub-Saharan African region, could learn from Hong Kong's practice in ensuring transparency and competition in PPP arrangements.

Other CSFs with significant differences between the two respondent groups are technology transfer and technological innovation. Although both CSFs are ranked lower by the two groups of respondents, their mean values are higher in Ghana than Hong Kong. As previously mentioned, technology transfer and innovation are important in Ghana and other developing countries because their PPP markets are dominated by foreign investors. Therefore, the GoG expects that through PPP projects the skills of local practitioners would be enhanced. In Hong Kong, most PPP projects are undertaken by locally based investors except for certain special projects such as the Hong Kong Disneyland PPP project. Therefore, the transfer of technology is not a major CSF for PPP projects in Hong Kong as well as other developed countries (Li et al., 2005).

Stable macroeconomic indicators and government providing guarantees are also observed to have significant differences between the two respondent groups. Stable macroeconomic indicator is ranked 8th and 32nd in Ghana and Hong Kong, respectively. Similarly, government providing guarantees is ranked 20th in Ghana, whereas it is ranked 30th in Hong Kong. The macroeconomic indicators which affect PPP investments include interest, inflation and exchange rates. Emphatically, these basic economic indicators have been unstable for the past five years in Ghana and other developing countries including Nigeria. The effect on PPP investments is that they make it difficult for private investors to accurately forecast their investment returns; and more importantly it increases the overall cost of projects. An example is seen in the Lekki toll road project, where unstable exchange rate resulted in higher operational cost, which then compelled the concessionaire to increase toll fee charges (Osei-Kyei and Chan, 2015b). Undeniably, achieving a stable macroeconomic condition in Ghana and other developing countries could take some period of time; hence, government guarantees in PPP projects are vital. Governments in developing countries need to provide sovereign guarantee and other forms of guarantees to enable investors secure the required funding from financial institutions; certainly this would help reduce the financing cost of PPP projects. Unlike Ghana, Hong Kong has enjoyed a stable macroeconomic condition for the past two decades. One possible reason is that Hong Kong is an international business hub, which hosts the head offices of most large private organisations from Europe and China. Certainly, considering the stable macroeconomic condition, the Hong Kong Government does not provide guarantees including sovereign guarantee for PPP project development. This therefore contributes to the low ranking of this CSF in Hong Kong.

The Ghanaian respondents also ranked right project identification and clarity of roles and responsibilities among parties higher than their Hong Kong counterparts. Indeed, in recent times identifying the right project for PPP procurement has become a very important issue to most governments in developing countries including the GoG (Public-Private Infrastructure Advisory Facility, 2009). This is because public departments and agencies are not able to properly identify the appropriate public facilities, which need to be procured through PPPs. Though more public infrastructure projects are required in developing countries, definitely not all public projects are suitable through PPP schemes. Therefore, in order to enable public departments in Ghana identify the right projects, the government through the Ghana Investment Promotion Council is developing a comprehensive National Infrastructure Plan. It is hoped that this infrastructure plan would guide the various municipal and metropolitan assemblies to select the most suitable public facility for PPP schemes. Also, the roles and responsibilities of parties in PPP arrangements in Ghana are sometimes confusing to the general public and the parties themselves. This is seen in the Ghana National Housing Project,

which was not implemented. In that project, the responsibilities of the government and the private investor became an issue for debate among civil society groups. This is because the government did not clearly articulate the duties of the private investor in the partnership arrangement. Moreover, the general public felt that the government was taking up more responsibilities than the private investor in the partnership arrangement. As opposed by the Hong Kong respondents, these CSFs are not critical in Hong Kong. This is understandable because proper feasibility studies and consultations are carried out prior to the implementation of PPP projects. This was actually seen in the Asia World Expo PPP project and Hong Kong Disneyland Theme park (Hayllar, 2010).

The other CSFs which are observed to have significant differences are rather ranked higher in Hong Kong than Ghana. They include clear project brief and design development, choosing the right private consortium, reasonable user fee charges, strong private consortium, appropriate risk allocation and clear goals and mutual benefit objectives. It is noticeable that these CSFs are rated higher in Hong Kong and directly relate to the organisation and relationship of PPP projects rather than the socio-political and economic conditions of the project as seen in Ghana's ranking. This implies that the CSFs regarding the political and economic conditions of PPP projects are of low importance in Hong Kong compared to the ones that affect the organisation and relationship of the project. This is understandable because Hong Kong and other developed countries already have a good socio-political and economic environment for PPP development, so their focus is now on how to deal with issues relating to the organisation of the project.

However, it must be highlighted that though the CSFs that relate to the organisation and relationship of PPP projects are ranked lower in Ghana and higher in Hong Kong, it does not mean that Ghana already observes these CSFs, so they are of low relevance in Ghana. Rather, the results suggest that Ghana and other developing countries need to first focus on the socio-political and economic conditions which affect the success of PPP projects; after that, the other CSFs are likely to be more critical as seen in Hong Kong's ranking.

5. Conclusions

This paper has empirically compared the CSFs for PPP projects in developing and developed countries using Ghana and Hong Kong as examples. Questionnaires were distributed to experienced PPP practitioners in both countries. Preliminary tests using the Kendall's concordance (W) indicated the consistency of responses on the ranking of CSFs by respondents within each group. This suggested the validity and authenticity of the survey responses for analysis. The mean score analysis was conducted to evaluate the level of importance of the CSFs by each group of respondent. Further, the mean values of CSFs for each country were grouped into quartiles (i.e. upper and lower quartiles) to identify the similarities in ranking. The results indicated that a favourable legal and regulatory framework is very critical in both Ghana and Hong Kong. On the contrary, technology transfer, technological innovation, public/community participation and coordination and government providing financial support are ranked lower in both countries. Further analysis using the Mann-Whitney U test reveals that the Ghanaian and Hong Kong respondents view 16 CSFs differently. Majority of the CSFs that are ranked higher in Ghana relate to the socio-political and economic conditions of PPP projects, whereas the CSFs ranked higher in Hong Kong directly relate to the organisation and relationship of PPP projects.

The outputs of this study provide several practical management measures that are essential in ensuring successful transnational PPP arrangements particularly between Africa and Asian advanced countries. First, both developing and developed countries should have well-established legal requirements for PPP arrangements. For developing countries particularly African countries, it is important that their legal framework would clearly specify the rights and obligations of potential investors particularly for non-locals.

Importantly, the existence of a general policy guideline may not adequately foster the successful implementation of PPPs. For developed countries, it is important that their legislations adequately specify the payment mechanism and limit to private sector freedom in toll settings.

Second, the socio-political and economic environments in developing countries need critical attention. Specifically, political support and political stability are very critical in ensuring positive impacts in the PPP arrangement. Opposition political parties should commit themselves into PPP arrangements and should not abrogate contracts when they come into administration. Also, transparency is crucial throughout the procurement process. As practiced by Hong Kong and other developed countries, an independent corruption unit should monitor the tendering and negotiation process. In addition, the progress of the procurement process should be communicated to the general public and other relevant external stakeholders. The economic indicators including interest rate and exchange rate should be stabilised. Good economic policies should be put in place to ensure the stability of these indicators which significantly affect the operational costs of PPP projects. Importantly, governments in developing countries should also provide guarantees to make PPP projects financially viable. This could be done through the establishment of innovative financing schemes such as the Viability Gap Fund and Infrastructure Financing Fund.

In the advanced economies, more measures should be put in place to ensure a better organisation and relationship in PPP project arrangements. Specifically, clear objectives and specifications should be provided. Undoubtedly, complex specifications and ambiguous objectives may result in poor relationship between project parties. Also, risks have to be appropriately shared and transferred among parties. In essence, parties should avoid incomplete transfer of risks.

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References

Abdel Aziz, A.M. (2007), "Successful delivery of public-private partnerships for infrastructure development", *Journal of Construction Engineering and Management*, Vol. 133 No. 12, pp. 918-931.

Abdul-Aziz, A.R. and Kassim, P.S.J. (2011), "Objectives, success and failure factors of housing public-private partnerships in Malaysia", *Habitat International*, Vol. 35 No. 1, pp. 150-157.

Akintoye, A., Hardcastle, C., Beck, M., Chinyio, E. and Asenova, D. (2003), "Achieving best value in private finance initiative project procurement", *Construction Management and Economics*, Vol. 21 No. 5, pp. 461-470.

Ameyaw, E.E. and Chan, A.P.C. (2015), "Risk ranking and analysis in PPP water supply infrastructure projects: an international survey of industry experts", *Facilities*, Vol. 33 Nos 7/8, pp. 428-453.

Aquilino, W.S. (1994), "Interview mode effects in surveys of drug and alcohol use: a field experiment", *Public Opinion Quarterly*, Vol. 58 No. 2, pp. 210-240.

Asia World Expo (2010), "AsiaWorld-Expo continues to add tremendous value to Hong Kong's exhibition industry and economy", available at: www.asiaworldexpo.com. hk/html/en/NewsRoom/PressReleaseDetail_ff73a51fda6e4a7383c60bf523a605bf.html (accessed 2 May 2015).

Askar, M. and Gab-Allah, A. (2002), "Problems facing parties involved in build operate, and transport projects in Egypt", *Journal of Management in Engineering*, Vol. 18 No. 4, pp. 173-178.

Babatunde, S.O., Opawole, A. and Akinsiku, O.E. (2012), "Critical success factors in public-private partnership (PPP) on infrastructure delivery in Nigeria", *Journal of Facilities Management*, Vol. 10 No. 3, pp. 212-225.

Chan, A.P., Lam, P.T., Chan, D.W., Cheung, E. and Ke, Y. (2010), "Critical success factors for PPPs in infrastructure developments: Chinese perspective", *Journal of Construction Engineering and Management*, Vol. 136 No. 5, pp. 484-494.

Chan, A.P.C., Yeung, J.F., Calvin, C.P., Wang, S.Q. and Ke, Y. (2011), "Empirical study of risk assessment and allocation of public-private partnership projects in China", *Journal of Management in Engineering*, Vol. 27 No. 3, pp. 136-148.

Cheung, E. (2009), "Developing a best practice framework for implementing public private partnerships (PPP) in Hong Kong", doctoral dissertation, Queensland University of Technology.

Cheung, E. and Chan, A. (2011), "Risk factors of public-private partnership projects in china: comparison between the water, power, and transportation sectors", *Journal of Urban Planning and Development*, Vol. 137 No. 4, pp. 409-415.

Cheung, E. and Chan, A.P.C. (2009), "Is BOT the best financing model to procure infrastructure projects? A case study of the Hong Kong-Zhuhai-Macau Bridge", *Journal of Property Investment & Finance*, Vol. 27 No. 3, pp. 290-302.

Cheung, E., Chan, A.P. and Kajewski, S. (2009), "Enhancing value for money in public private partnership projects: findings from a survey conducted in Hong Kong and Australia compared to findings from previous research in the UK", *Journal of Financial Management of Property and Construction*, Vol. 14 No. 1, pp. 7-20.

Cheung, E., Chan, A.P.C. and Kajewski, S. (2012), "Factors contributing to successful public private partnership projects, comparing Hong Kong with Australia and the United Kingdom", *Journal of Facilities Management*, Vol. 10 No. 1, pp. 45-58.

Cheung, E., Chan, A.P.C., Lam, P.T.I., Chan, D.W.M. and Ke, Y. (2012), "A comparative study of critical success factors for public private partnerships (PPP) between Mainland China and the Hong Kong special administrative region", *Facilities*, Vol. 30 Nos 13/14, pp. 647-666.

Chou, J.S. and Pramudawardhani, D. (2015), "Cross-country comparisons of key drivers, critical success factors and risk allocation for public-private partnership projects", *International Journal of Project Management*, Vol. 33 No. 5, pp. 1136-1150.

Cobb, J.M. (2005), Financing Bangkok's Mass Transit, IDC TransGate, International Development Consultants, LLC.

Dixon, T., Pottinger, G. and Jordan, A. (2005), "Lessons from the private finance initiative in the UK: benefits, problems and critical success factors", *Journal of Property Investment & Finance*, Vol. 23 No. 5, pp. 412-423.

Dulaimi, M.F., Alhashemi, M., Ling, F.Y.Y. and Kumaraswamy, M. (2010), "The execution of public-private partnership projects in the UAE", *Construction Management and Economics*, Vol. 28 No. 4, pp. 393-402.

Efficiency Unit (2008), *Serving the Community by Using the Private Sector – An Introductory Guide to Public Private Partnerships*, 2nd ed., Efficiency Unit, The Hong Kong Special Administrative Region, Government, Hong Kong.

Esty, B.C. (2001), "Structuring loan syndicates: a case study of the Hong Kong Disneyland project loan", *Journal of Applied Corporate Finance*, Vol. 14 No. 3, pp. 80-95.

Field, A. (2013), *Discovering Statistics using IBM SPSS Statistics*, Sage Publication, London.

Gannon, M.J. and Smith, N.J. (2011), "An effective outline business case to facilitate successful decision-making", *Construction Management and Economics*, Vol. 29 No. 2, pp. 185-197.

Harvie, C. and Lee, B.C. (2002), *The Role of Small and Medium Enterprises in National Economies in East Asia*, Edward Elgar, Cheltenham.

Hardcastle, C., Edwards, P.J., Akintoye, A. and Li, B. (2005), "Critical success factors for PPP/PFI projects in the UK construction industry", *Conference on Public Private Partnerships; Opportunities and Challenges, The Hong Kong Institution of Engineers – Civil Division and The University of Hong Kong, Hong Kong*, pp. 75-83.

Hayllar, M.R. (2010), "Public-private partnerships in Hong Kong: good governance – the essential missing ingredient?", *Australian Journal of Public Administration*, Vol. 69 No. 1, pp. S99-S119.

Ho, P.H. (2006), "Development of public private partnerships (PPPs) in China", *International Roundup*, Vol. 19 No. 1.

Hwang, B.G., Zhao, X. and Gay, M.J.S. (2013), "Public private partnership projects in Singapore: factors, critical risks and preferred risk allocation from the perspective of contractors", *International Journal of Project Management*, Vol. 31 No. 3, pp. 424-433.

Ismail, S. (2013), "Critical success factors of public private partnership (PPP) implementation in Malaysia", *Asia-Pacific Journal of Business Administration*, Vol. 5 No. 1, pp. 6-19.

Jacobson, C. and Choi, S.O. (2008), "Success factors: public works and public-private partnerships", *International Journal of Public Sector Management*, Vol. 21 No. 6, pp. 637-657.

Jamali, D. (2004), "Success and failure mechanisms of public private partnerships (PPPs) in developing countries: insights from the Lebanese context", *The International Journal of Public Sector Management*, Vol. 17 No. 5, pp. 414-430.

Jefferies, M. (2006), "Critical success factors of public private sector partnerships: a case study of the Sydney SuperDome", *Engineering, Construction and Architectural Management*, Vol. 13 No. 5, pp. 451-462.

Jefferies, M., Gameson, R. and Rowlinson, S. (2002), "Critical success factors of the BOOT procurement system: reflections from the stadium Australia case study", *Engineering Construction and Architectural Management*, Vol. 9 No. 4, pp. 352-361.

Kumaraswamy, M.M. and Morris, D.A. (2002), "Build-operate-transfer-type procurement in Asian megaprojects", *Journal of Construction Engineering and Management*, Vol. 128 No. 2, pp. 93-102.

Li, B., Akintoye, A., Edwards, P.J. and Hardcastle, C. (2005), "Critical success factors for PPP/PFI projects in the UK construction industry", *Construction Management and Economics*, Vol. 23 No. 5, pp. 459-471.

Liu, T. and Wilkinson, S. (2013), "Can the pilot public-private partnerships project be applied in future urban rail development? A case study of Beijing Metro Line 4 project", *Built Environment Project and Asset Management*, Vol. 3 No. 2, pp. 250-263.

Liu, T., Wang, Y. and Wilkinson, S. (2016), "Identifying critical factors affecting the effectiveness and efficiency of tendering processes in public-private partnerships (PPPs): a comparative analysis of Australia and China", *International Journal of Project Management*, Vol. 34 No. 4, pp. 701-716.

Meng, X., Zhao, Q. and Shen, Q. (2011), "Critical success factors for transfer-operate-transfer urban water supply projects in China", *Journal of Management in Engineering*, Vol. 27 No. 4, doi: 10.1061/(ASCE)ME.1943-5479.0000058.

Ministry of Finance and Economic Planning (2011), "National policy on public-private partnerships", Government of Ghana, Ghana.

Mladenovic, G., Vajdic, N., Wundsch, B. and Temeljotov-Salaj, A. (2013), "Use of key performance indicators for PPP transport projects to meet stakeholders' performance objectives", *Built Environment Project and Asset Management*, Vol. 3 No. 2, pp. 228-249.

Ng, S.T., Wong, Y.M. and Wong, J.M. (2012), "Factors influencing the success of PPP at feasibility stage – a tripartite comparison study in Hong Kong", *Habitat International*, Vol. 36 No. 4, pp. 423-432.

Nisar, T.M. (2013), "Implementation constraints in social enterprise and community public private partnerships", *International Journal of Project Management*, Vol. 31 No. 4, pp. 638-651.

Osei-Kyei, R. and Chan, A.P.C. (2015a), "Review of studies on the critical success factors for public-private partnership (PPP) projects from 1990 to 2013", *International Journal of Project Management*, Vol. 33 No. 6, pp. 1335-1346.

Osei-Kyei, R. and Chan, A.P.C. (2015b), "Developing transport infrastructure in Sub-Saharan Africa through public-private partnerships: policy practice and implications", *Transport Reviews*, Vol. 36 No. 2, pp. 1-17.

Osei-Kyei, R. and Chan, A.P.C. (2016a), "Implementation constraints in public-private partnership: empirical comparison between developing and developed countries", *Journal of Facilities Management*, Vol. 15 No. 1, pp. 90-106.

Osei-Kyei, R. and Chan, A.P.C. (2016b), "Implementing public-private partnership policy for public construction project in Ghana: critical success factors and policy implications", *International Journal of Construction Management*, Vol. 17 No. 2, pp. 113-123, doi: doi.org/10.1080/15623599.2016.1207865.

Osei-Kyei, R., Dansoh, A. and Ofori-Kuragu, J.K. (2014), "Reasons for adopting public-private partnership (PPP) for construction projects in Ghana", *International Journal of Construction Management*, Vol. 14 No. 4, pp. 227-238.

Ozdoganm, I.D. and Birgonul, M.T. (2000), "A decision support framework for project sponsors in the planning stage of build-operate-transfer (BOT) projects", *Construction Management and Economics*, Vol. 18 No. 3, pp. 343-353.

Partnerships UK (2006), "PFI strengthening long term partnerships", HM Treasury, London.

Public-Private Infrastructure Advisory Facility (2009), "Toolkit for public private partnership in roads and highways: selecting PPP projects", World Bank Publications, Washington, DC.

Qiao, L., Wang, S.Q., Tiong, R.L. and Chan, T.S. (2001), "Framework for critical success factors of BOT projects in China", *The Journal of Structured Finance*, Vol. 7 No. 1, pp. 53-61.

Qiao, L., Wang, S.Q., Tiong, R.L. and Chan, T.S. (2002), "Critical success factors for tendering BOT infrastructure projects in China", *The Journal of Structured Finance*, Vol. 8 No. 1, pp. 40-52.

Raisbeck, P. and Tang, L.C. (2013), "Identifying design development factors in Australian PPP projects using an AHP framework", *Construction Management and Economics*, Vol. 31 No. 1, pp. 20-39.

Reinhardt, W. (2011), "The role of private investment in meeting US transportation infrastructure needs", *Public Works Financing*, Vol. 260, pp. 1-31.

Rockart, J.F. (1982), "The changing role of the information systems executive: a critical success factors perspective", *Sloan Management Review*, Vol. 24 No. 1, pp. 3-13.

Shen, L.Y., Platten, A. and Deng, X.P. (2006), "Role of public private partnerships to manage risks in public sector projects in Hong Kong", *International Journal of Project Management*, Vol. 24 No. 7, pp. 587-594.

Sheskin, D.J. (2011), *Handbook of Parametric and Nonparametric Statistical Procedures*, 5th ed., Chapman & Hall/CRC, Boca Raton, FL.

State Government of Victoria (2015), "Public-private partnership", available at: www.dtf.vic.gov.au/Infrastructure-Delivery/Public-private-partnerships (accessed 8 January 2015).

Szolnoki, G. and Hoffmann, D. (2013), "Online, face-to-face and telephone surveys – comparing different sampling methods in wine consumer research", *Wine Economics and Policy*, Vol. 2 No. 2, pp. 57-66.

Tam, C.M. (1999), "Build-operate-transfer model for infrastructure developments in Asia: reasons for successes and failures", *International Journal of Project Management*, Vol. 17 No. 6, pp. 377-382.

Tang, L. and Shen, Q. (2013), " 'Factors affecting effectiveness and efficiency of analysing stakeholders' needs at the briefing stage of public private partnership projects", *International Journal of Project Management*, Vol. 31 No. 4, pp. 513-521.

Tang, L., Shen, Q., Skitmore, M. and Cheng, E.W. (2012), "Ranked critical factors in PPP briefings", *Journal of Management in Engineering*, Vol. 29 No. 2, pp. 164-171.

Tiong, R.L. (1996), "CSFs in competitive tendering and negotiation model for BOT projects", *Journal of Construction Engineering and Management*, Vol. 122 No. 3, pp. 205-211.

Tiong, R.L.K., Yeo, K.T. and McCarthy, S.C. (1992), "Critical success factors in winning BOT contracts", *Journal of Construction Engineering and Management*, Vol. 118 No. 2, pp. 217-228.

Wibowo, A. and Alfen, H.W. (2014), "Identifying macro-environmental critical success factors and key areas for improvement to promote public-private partnerships in infrastructure: Indonesia's perspective", *Engineering, Construction and Architectural Management*, Vol. 21 No. 4, pp. 383-402.

World Bank (2015), "Private participation in infrastructure (PPI)", Regional Snapshots, World Bank, Washington, DC, available at: http://ppi.worldbank.org/explore/ppi_exploreRegion.aspx?regionID=1 (accessed 3 May 2015).

World Bank (2016a), "World bank country and lending groups", available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519 (accessed 4 May 2016).

World Bank (2016b), "GNI per capita, Atlas method (current US$)", available at: http://data.worldbank.org/indicator/NY.GNP.PCAP.CD (accessed 4 May 2016).

World Bank Group (2015), "Data: population total", available at: http://data.worldbank.org/country (accessed 5 June 2016).

Xu, Y., Chan, A.P.C. and Yeung, J.F. (2010), "Developing a fuzzy risk allocation model for PPP projects in China", *Journal of Construction Engineering and Management*, Vol. 136 No. 8, pp. 894-903.

Yescombe, E.R. (2011), *Public-Private Partnerships Principles of Policy and Finance*, Elsevier, London.

Zhang, X.Q. (2005a), "Criteria for selecting the private-sector partner in public-private partnerships", *Journal of Construction Engineering and Management*, Vol. 131 No. 6, pp. 631-644.

Zhang, X.Q. (2005b), "Critical success factors for public-private partnerships in infrastructure development", *Journal of Construction Engineering and Management*, Vol. 131 No. 1, pp. 3-14.

Further reading

Chan, A.P., Lam, P.T., Chan, D.W., Cheung, E. and Ke, Y. (2009), "Drivers for adopting public private partnerships – empirical comparison between China and Hong Kong special administrative region", *Journal of Construction Engineering and Management*, Vol. 135 No. 11, pp. 1115-1124.

Zhang, X.Q. (2004), "Concessionaire selection: methods and criteria", *Journal of Construction Engineering and Management*, Vol. 130 No. 2, pp. 235-244.

Zou, W., Kumaraswamy, M., Chung, J. and Wong, J. (2014), "Identifying the critical success factors for relationship management in PPP projects", *International Journal of Project Management*, Vol. 32 No. 2, pp. 265-274.

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