

Comparative Analysis of the Success Criteria for Public–Private Partnership Projects in Ghana and Hong Kong

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ABSTRACT ■

The criteria for measuring the success of public–private partnership (PPP) projects have become very topical because of the global interest in PPP project success. This article empirically investigates the differences and similarities of PPP project success criteria in developing and developed economies, represented by Ghana and Hong Kong, respectively. Results reveal profitability, meeting output specifications, and adherence to budget as the top three success criteria in Ghana, whereas adherence to budget, adherence to time, and effective risk management are considered more important in Hong Kong. The findings inform practitioners of the success measures considered in PPP in developing and developed countries.

KEYWORDS: public–private partnerships; success criteria; project success; Ghana; Hong Kong; developing economy; developed economy

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INTRODUCTION ■

Over the last couple of decades, the concept of public–private partnership (PPP) has gained considerable attention in both developing and developed countries (Osei-Kyei & Chan, 2015a; Zhang, 2005). The PPP policy is now considered as an effective and established strategy for procuring public infrastructure (Chou & Pramudawardhani, 2015). Through PPP schemes, the public sector is able to outsource risks to the private investor so that cost efficiency and value for money are enhanced in delivering public facilities. Furthermore, through PPP schemes, public facilities are better managed and maintained compared with the conventional bid-build procurement system (Ke, Wang, Chan, & Cheung, 2011).

Importantly, considering the global interest in the PPP concept, many researchers have attempted to explore the critical success factors for PPP projects in both developing and developed economies/countries (Osei-Kyei & Chan, 2015a; Cheung, Chan, & Kajewski, 2012; Liu & Wilkinson, 2013; Li, Akintoye, Edwards, & Hardcastle, 2005a; Babatunde, Opawole, & Akinsiku, 2012). Despite the wide coverage of studies on critical success factors, the success criteria for PPP projects in developing and developed economies have received little or no attention in the mainstream literature. In recent times, success criteria have become very crucial because, without an in-depth insight into the criteria for PPP project success, it will be very challenging for investors and public authorities in either a developing or developed economy to completely assess whether their implemented projects have become successful or not. Nonetheless, there have been reported controversies in both developing and developed economies on whether or not implemented PPP projects have been successful (c.f. Tam, 1999; Osei-Kyei & Chan, 2015b). This therefore calls for the need to empirically evaluate the success criteria for PPP projects in developing and developed economies (Osei-Kyei, Chan, Javed, & Ameyaw, 2017).

As part of a larger research project that aims to develop a best practice framework for PPP implementation in Ghana, drawing on international experiences specifically from Hong Kong (Osei-Kyei & Chan, 2017), this article empirically investigates the differences and similarities of the success criteria for PPP projects in developing and developed economies, represented by Ghana and Hong Kong.

The basic reason for conducting a comparative study between a developing and developed economy is because PPP policy has grown and is now a global concept in which investors, consultants, financiers, and public officials are engaged irrespective of their cultural backgrounds and/or geographical differences (Osei-Kyei & Chan, 2017). Therefore, it will not be considerably

beneficial to explore the success criteria for PPP projects from a specific economic jurisdiction or country's perspective (i.e., developing or developed economy). Comparing the differences and similarities of PPP project success criteria in diverse economies is more appropriate; essentially, this will inform international private investors of the core areas where resources are needed in order to achieve success when entering into PPP arrangements in any part of the world (Osei-Kyei & Chan, 2017). Additionally governments, which have yet to adopt the PPP concept, will understand the success measures considered by other countries with similar or different economic conditions.

The findings of this study add to the knowledge on international best practices for PPP; specifically, they provide in-depth insight into what constitutes PPP project success in either a developing or developed economy. Moreover, they inform practitioners of the prevailing similarities and differences on the criteria for measuring PPP project success in developing and developed economies and/or countries. It is expected that international investors will be informed of the expectations of countries with different economic conditions when engaging in PPP arrangements.

Literature Review on PPP Project Success Criteria

Success criteria are defined as principles or standards by which something is judged as successful (Lim & Mohamed, 1999). Specifically, when a set of objectives for a project are fully achieved, then that project can be deemed successful (Ika, 2009). Over the past few decades, many researchers have explored the success criteria for construction projects, particularly for traditional bid-build projects (Jugdev & Müller, 2005). Time, cost, and quality have been the most frequently identified criteria for measuring the success of construction projects (Pinto & Slevin, 1989; Lim & Mohamed, 1999).

These criteria are what Atkinson (1999) labeled, the 'iron triangle.' (Ika, 2009)

Essentially, the iron triangle has been criticized by many traditional researchers for being narrow and geared toward the satisfaction of only clients and contractors (Al-Tmeemy, Abdul-Rahman, & Harun, 2011). In this regard, studies, including those by Ahadzie, Proverbs, and Olomolaiye (2008), Westerveld (2003), Cox, Issa, and Ahrens (2003), and Toor and Ogunlana (2010) have presented additional success measures that encompass more qualitative success criteria. Some of the qualitative measures include no contractual disputes, safety, technology transfer, low environmental impact, trust and respect, and long-term partnerships.

Considering that PPP projects have unique characteristics and features, such as the sharing of risks and responsibilities, mutual objectives and goals, and long-term arrangements (Akintoye, Hardcastle, Beck, Chinyio, & Asenova, 2003), very few success criteria of traditional bid-build projects are equally applicable. However, a review of past studies with a focus on the performance objectives, performance indicators, and performance measures of PPP projects could help to develop concise and well-defined success criteria for PPP projects (Osei-Kyei et al., 2017). Satisfying the need for public facility and/or service has been identified to be a critical performance objective in PPP project delivery (Yuan, Zeng, Skibniewski, & Li, 2009). Very often, PPP projects are initiated out of a special need. For example, in Norway, one of the critical needs for procuring the E39 Klett-Baarshaug project through a PPP scheme was to reduce the number of reported road accidents (COST Action TU1001, 2014). Thus, a considerable reduction in the number of accidents means that the need for such public facility using the PPP approach has been satisfied. It must be highlighted, however, that different countries may have different needs for procuring PPP

projects and, emphatically, this varies among developing and developed economies.

Reduced public sector administrative cost has also been reported to be a critical performance objective for PPP projects, thus a potential candidate for PPP project success criteria (Zhang, 2006; Yuan et al., 2009). Considering the fact that PPP allows the public sector to transfer risks to the private sector, it is expected that the administrative costs of the public sector will be reduced (Li, Akintoye, Edwards, & Hardcastle, 2005b). Importantly, this is not often seen in traditional bid-build procurement projects. In traditional public construction projects, the public sector retains more risks, which most of the time increase its administrative costs. The public sector's administrative costs could even be much higher in very complex projects procured using the traditional bid-build system.

Effective risk management is very important in measuring PPP project success and has been mentioned as a critical performance measure of PPP projects (Dixon, Pottinger, & Jordan, 2005; Liu, Love, Davis, Smith, & Regan, 2015). Risk management is a key component of PPP project management (Xu et al., 2010). If risks are not properly managed, the tendency for a project to fail is very high (Chou & Pramudawardhani, 2015). Effective risk management simply implies properly identifying risks, assessing and completely allocating them to the party with better control of mitigation measures (Osei-Kyei et al., 2017). Furthermore, there are many projects around the world that have failed to progress successfully due to improper risk identification and incomplete transfer of risks (Osei-Kyei & Chan, 2015b).

Reduced public and political protests in PPPs are very relevant when assessing the success of PPP projects (Osei-Kyei et al., 2017). Public and political protests often disrupt the flow of the PPP process. Because of political protests, PPP projects could take several years before being implemented.

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Protests occur when the general public and political parties are not convinced with the transparency and accountability of the procurement process. Toll hikes can also cause public and political agitation (Osei-Kyei & Chan, 2015b). However, it must be emphasized that the significance of this criterion depends on the political, social, and economic settings of a country.

Output specifications are used mostly in PPPs compared with input specifications (Lam & Javed, 2015). Thus, meeting output standards and/or requirements in a PPP arrangement could be considered to be a success measure (Osei-Kyei et al., 2017). Meeting output specifications contributes substantially to the satisfaction of users and the public client.

Local economic development is one of the success measures considered to be peculiar to PPP projects (Osei-Kyei et al., 2017). Generally, there is an expectation that through PPP schemes more job opportunities will be created because of the large scale and complexity of PPP projects. In addition, PPP projects are expected to offer better standards of living within the communities in which they are implemented (Osei-Kyei & Chan, 2015b); therefore, PPP projects that do not contribute substantially in terms of job opportunities and better access to public facilities could be deemed unsuccessful. The criticality of this criterion also depends on the jurisdiction; essentially, its significance could vary among developing and developed countries.

Research Methodology

Prior Literature and Pre-Testing

Based on a thorough review of earlier literature, Osei-Kyei et al. (2017) developed a comprehensive set of criteria for measuring PPP project success. The set of criteria was then sent to six PPP experts from the academic and industrial sectors—four from Ghana and two from Hong Kong (Osei-Kyei & Chan, 2017). The purpose of the pre-testing was to confirm the suitability of the criteria

in each jurisdiction. Essentially, the experts confirmed the applicability and adequacy of the criteria within each jurisdiction. Table 1 shows the set of criteria for measuring PPP project success (Osei-Kyei et al., 2017).

Empirical Questionnaire Survey

A questionnaire survey was undertaken in Ghana and Hong Kong with relevant PPP practitioners between May 2015 and April, 2016 (Osei-Kyei & Chan, 2017). The questionnaire required respondents to rate the importance of each PPP project success criterion on a five-point Likert scale (i.e., 1 = least important and 5 = extremely important), as applied in their respective jurisdictions. Respondents were selected based on a two-stage sampling approach (Osei-Kyei & Chan, 2017). First, pre-defined criteria were used to identify initial prospective respondents. The criteria were: (1) the respondent should have in-depth knowledge on the general practice of PPP and should have followed the development of PPP in Ghana or Hong Kong very closely; and (2) the respondent should have extensive hands-on (i.e., at least one project) and/or research experience in PPP project delivery in Ghana or Hong Kong (Osei-Kyei & Chan, 2017). In the second stage, the identified respondents were asked to suggest potential colleagues who may be interested in participating in the research study. Most of the suggested prospective participants willingly agreed to participate in the study and were included in the final list of respondents (Osei-Kyei & Chan, 2017).

Overall, 207 respondents from the academic and industrial sectors were sourced and identified from dedicated private sector organizations, PPP-related publications with a focus on Ghana or Hong Kong, and public institutions with a strong interest in PPP projects (e.g., Ghana [Ghana Highways Authority, Department of Urban Roads, Public Investment Division, Ghana Water Company Limited, Ghana Ports and Harbours Authority,

local government departments]; and Hong Kong [Housing Department; Hospital Authority, Highways Department, Efficiency Unit]) (Osei-Kyei & Chan, 2017). Of the total respondents identified, 120 came from Ghana, whereas 87 came from Hong Kong. A large number of respondents (i.e., 120 respondents) were identified in Ghana because, during the last couple of years, more public institutions have introduced quite a large number of PPP projects (i.e., over 18 major construction PPP projects) (Ministry of Finance and Economic Planning, 2011); therefore, more people are involved with PPP practices in Ghana than in Hong Kong. In addition, the population size of Ghana (approximately 26.7 million) is much higher than the population size of Hong Kong (approximately 7.24 million) (World Bank Group, 2015) (Osei-Kyei & Chan, 2017), thus there is a tendency to identify more potential respondents in Ghana than Hong Kong. Questionnaires were distributed to targeted respondents either through face-to-face meetings (i.e., the majority of questionnaires administered in Ghana) and/or emails (i.e., the majority of questionnaires administered in Hong Kong) (Osei-Kyei & Chan, 2017).

In total, 103 completed questionnaires were received—77 from Ghana and 26 from Hong Kong, which represent response rates of 64.17% and 29.89% for Ghana and Hong Kong, respectively (Osei-Kyei & Chan, 2017).

The higher response rate in Ghana was anticipated considering that the majority of questionnaires were administered in person, which always yields a favorable response rate compared with online and telephone surveys (Szolnoki & Hoffman, 2013; Aquilino, 1994; Osei-Kyei & Chan, 2017). Although a lower response rate was obtained in Hong Kong, the sample size of 26 is considered satisfactory and reasonable when compared with previous related studies, which were conducted in Hong Kong (see, for example, Cheung et al., 2012 [34 responses]; Javed, 2013

Success Criteria	Descriptions	Sources												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Profitability	A continuous income/profit is received by parties during project operation.		X									X		
Long-term relationship and partnership	Cordial relationship and well-established coordination are instituted among stakeholders.													X
Satisfying the need for public facility and/or service	An implemented PPP project fully satisfies the need for a public facility and/or service.												X	X
Adherence to time	Project is constructed on and/or before time schedule for commissioning.								X					
Adherence to budget	Project is constructed according to the estimated cost and is without any operational cost overruns.					X		X	X					
Reduced litigations and disputes	Contract litigations and disputes are minimized throughout the project life cycle.		X		X									
Reduced public sector administrative cost	Lower cost is incurred by the public sector in the administration of the project because major project risks are allocated to the private sector.							X			X			X
Effective technology transfer and innovation	Technical knowledge and innovation are effectively shared among stakeholders, particularly with local practitioners.											X		
Local economic development	The project contributes to the economic development of the community within which the project is developed.				X									
Environmental performance	The project does not affect the health and safety of residents or the environment.				X		X	X						
Reduced project life cycle cost	Lower life cycle cost is realized, which enhances the project's value for the money.													X
Reliable and quality service operations	Continuous and uninterrupted project services are provided and according to the satisfaction of users.			X					X					
Meeting output specifications	The project meets the expected output standards and/or requirements and delivery.	X							X	X				
Effective risk management	Risks are properly identified. The risk sharing and transfer mechanisms are agreed on and effectively implemented by the public and private parties.										X		X	
Reduced public and political protests	There are reductions in agitation and protests, which often arise due to increases in tariffs, lack of transparency, corruption, and so forth.							X						

1 = Lam and Javed (2015), 2 = Chan and Chan (2004), 3 = Meng et al. (2011), 4 = Zhang (2006a), 5 = Cheung, Tam, Ndekugri, and Harris (2000), 6 = Chan, Scott, and Lam (2002), 7 = Zhang (2006b), 8 = Dixon et al. (2005), 9 = Liyanage and Villalba-Romero (2015), 10 = Li et al. (2005b), 11 = Mladenovic et al. (2013), 12 = Liu et al. (2015), 13 = Yuan et al. (2009)

Table 1: A set of 15 success criteria for PPP projects (Osei-Kyei et al., 2017).

[18 responses]). More importantly, the respondents from Hong Kong possess rich PPP experience both in practice and research, which makes their responses suitable and adequate for further

analysis (Table 2). Notwithstanding, the overall sample size of 103 is adequate and suitable for analysis when compared with past related studies, including those from Cheung et al. (2012)

(45 responses—34 from Hong Kong and 11 from Australia) and Liu, Wang, and Wilkinson (2016) (57 responses—32 from China and 25 from Australia) (Osei-Kyei & Chan, 2017). A summary

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Demographics	Ghana		Hong Kong	
	Number of Replies	Percentage (%)	Number of Replies	Percentage (%)
Sector of PPP				
Public	35	45.5	12	46.2
Academic	15	19.5	6	23.1
Private	27	35.1	8	30.8
Total	77	100	26	100
Years of industrial and/or research experience				
≤ 5 years	29	37.7	9	34.6
6–15 years	42	54.6	13	50.0
≥ 16 years	6	7.8	4	15.4
Total	77	100	26	100

Table 2: Profiles of respondents (Osei-Kyei & Chan, 2017).

of the respondents' profiles is presented in Table 2 (Osei-Kyei & Chan, 2017).

Analytical Techniques

The Statistical Package for Social Sciences (SPSS) 21.0 was used to perform statistical tests, including Kendall coefficient of concordance, mean score ranking, and the Mann–Whitney U test. First, the degree of consistency on responses within each respondent group (i.e., Ghana and Hong Kong) was measured using the Kendall's concordance analysis. This analysis was conducted because different respondents from different sectors (i.e., public, private, and academic sectors) participated in the survey, thus it was vital to test the degree of consistency among responses in each respondent group (i.e., Ghana and Hong Kong) (Osei-Kyei & Chan, 2017). Second, the ranking of factors (i.e., PPP project success criteria) in each respondent group was determined using the mean score analysis. Third, the Mann–Whitney U test was used to identify the significant difference(s) on the ranking of factors among respondents from both jurisdictions. The test was conducted at a significance level of 0.05. This non-parametric test tool was used because of the unequal sample sizes of the two independent groups. Further,

the data set is not assumed to follow any distribution pattern (Sheskin, 2011; Osei-Kyei & Chan, 2017). Last, to identify the similarities in the top and bottom rankings of factors, the mean values were grouped into quartiles (upper and lower quartiles). Based on the groupings, the success criteria for PPP projects with similar rankings in both countries were identified (Osei-Kyei & Chan, 2017).

Results and Discussion

Consistency of Responses in Each Group

The Kendall's coefficient of concordance (W) was conducted for each independent group at a significance level of 0.05. The test was conducted with a hypothesis that there is no consistency on the ranking of factors among respondents in a respondent group. Thus, a p-value of less than 0.05 means a rejection of the null hypothesis. The computed W values are 0.345 and 0.561 for Ghana and Hong Kong, respectively. Both respondent groups had 0.00 as their significance value, which is below 0.05; thus, the null hypothesis is rejected for each group. This suggests that there are consistency and agreement on the ranking of factors among respondents in each group, which reaffirms the

validity and genuineness of the survey responses for further analysis.

Mean Analysis and Significant Difference(s) on the Rankings of PPP Project Success Criteria in Ghana and Hong Kong

The mean ranking of PPP project success criteria for each respondent group is shown in Table 3. It is noticeable that the mean values range from 2.70 to 4.40 for Ghana and 2.23 to 4.42 for Hong Kong, respectively. The standard deviations in responses are 1.7 and 2.19 for Ghana and Hong Kong, respectively. Clearly, the large deviation in Hong Kong suggests that the Hong Kong respondents did not rate the set of criteria similarly as their Ghanaian counterparts.

The last column in Table 3 shows the significant test results on the ranking of PPP project success criteria among respondents from Ghana and Hong Kong. The test was conducted at a pre-defined significance test value of 0.05. Thus, a success criterion with a p-value of less than 0.05 indicates that respondents from both countries view the importance of that criterion differently. As presented in Table 3, nine of the fifteen PPP project success criteria are significantly different among the two countries. Clearly, this finding

PPP Project Success Criteria	Ghana		Hong Kong		Ghana and Hong Kong		Mann–Whitney U test		
	Mean	Rank	Mean	Rank	Mean	Rank	U statistics	Z	p value
Meeting output specifications	4.32	2	4.15	4	4.28	1	830.5	−1.485	0.137
Adherence to budget	4.23	3	4.42	1	4.28	2	825	−1.467	0.142
Adherence to time	4.14	4	4.35	2	4.19	3	849.5	−1.258	0.208
Profitability	4.40	1	3.31	11	4.13	4	320.5	−5.513	0.000*
Effective risk management	3.78	6	4.27	3	3.90	5	644.5	−2.938	0.003*
Reliable and quality service operations	3.87	5	3.88	5	3.87	6	1000.5	−0.004	0.996
Environmental performance	3.64	7	3.38	10	3.57	7	843	−1.306	0.191
Reduced public and political protests	3.49	10	3.08	12	3.39	8	681	−2.615	0.009*
Long term relationship and partnership	3.38	11	3.42	9	3.39	9	985.5	−0.127	0.899
Reduced litigations and disputes	3.55	9	2.58	13	3.30	10	438.5	−4.53	0.000*
Local economic development	3.56	8	2.23	15	3.22	11	212	−6.335	0.000*
Effective technology transfer and innovation	3.36	12	2.38	14	3.12	12	450.5	−4.37	0.000*
Reduced public sector administrative cost	2.96	13	3.54	7	3.11	13	589.5	−3.448	0.001*
Reduced project life cycle cost	2.84	14	3.69	6	3.06	14	398	−4.999	0.000*
Satisfying the need for public facility and/or service	2.70	15	3.46	8	2.89	15	509.5	−3.918	0.000*

Table 3: Mean ranking and Mann–Whitney U test results of the success criteria for PPP projects in Ghana and Hong Kong.

supports assertions that PPP practice varies among different economies, specifically among developing and developed economies (Osei-Kyei & Chan, 2015a). Thus, different criteria are used to measure the success of PPP projects in these two diverse economies (Osei-Kyei et al., 2017).

Importantly, the success criteria with significant differences that are ranked higher in Ghana and lower in Hong Kong relate directly to dispute minimization and social and economic developments associated with PPPs. These include profitability, reduced public and political protests, reduced litigations and disputes, local economic development, and effective technology transfer and innovation. This is not surprising considering the fact that disputes in PPPs due to public opposition are common setbacks in developing

countries, particularly in Ghana and other sub-Saharan African countries (Osei-Kyei & Chan, 2015b; Amadi, Carrillo, & Tuuli, 2014). In addition, economic and social developments associated with PPP implementation have been identified as some of the reasons why governments in developing economies, particularly Ghana, enter into PPP arrangements (Osei-Kyei, Dansoh, & Ofori-Kuragu, 2014).

Profitability is ranked first in Ghana and eleventh in Hong Kong. In essence, there is a very wide mean difference between the two jurisdictions (i.e., 4.40 in Ghana and 3.31 in Hong Kong). This finding is in line with assertion by the World Bank, Infrastructure Consortium for Africa (ICA), and Public–Private Infrastructure Advisory Facility (PPIAF) (2009) that PPP projects in African countries, including Ghana, that are not

likely to generate enough profit for parties stand the chance of not being successful. Profitability is critical in Ghana because of the many risks associated with PPP projects, which make them very costly. Emphatically, procuring PPP projects in Ghana requires huge capital due to the unfavorable economic conditions; thus, project parties are very keen on the profitability of the project. It must be emphasized that in Ghana's PPP practice, it is not only the private investor who desires to achieve adequate profit; the government also expects maximum investment returns. This is because most projects are supported financially by the government, either in the form of debt or equity financing (Ministry of Finance and Economic Planning, 2011). More importantly, the Government of Ghana (GoG) aims to use the proceeds from PPP

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projects to strengthen its infrastructure investment fund and other funding schemes.

Unlike Ghana, Hong Kong does not consider profitability a key success measure for PPP projects, which is understandable because, according to Chan, Lam, Chan, Cheung, and Ke (2009), over the last couple of years, Hong Kong has enjoyed abundant financial reserves and a budget surplus, therefore, financial drive is not as critical as that seen in Ghana. Although private investors in Hong Kong may consider profit important, the government certainly does not consider it a priority in PPP arrangements (Cheung et al., 2012).

Reduced public and political protests are ranked tenth in Ghana and twelfth in Hong Kong. Although this is a close ranking, the mean difference is large (i.e., 3.49 in Ghana and 3.08 in Hong Kong). Public and political protests in PPPs are not uncommon in Ghana. Very often the lack of transparency and accountability on the part of project parties raise questions and doubts among the general public. Other protests may also come as a result of high user charges and lack of cooperation (Ismail & Haris, 2014). This was seen in the Ghana National Housing Project attempted by the GoG in 2011. In that project, there were countless demonstrations and political agitations on the accountability and transparency of the PPP arrangement. A section of the populace believed that the government had not bargained in the interest of the general public but favored the private investor (Ghana News Agency, 2010). This notwithstanding, in Nigeria, which is a developing economy, Osei-Kyei and Chan (2015b) reported that several demonstrations and protests occurred as a result of high user fees and the lack of cooperation among stakeholders. Although public and political protests over PPP arrangements may be difficult to eradicate in Ghana, essentially their occurrences should be reduced to the lowest in order to make PPP projects successful.

With respect to Hong Kong, public and political protests are not as rampant as those seen in Ghana and other African countries. Thus, it is understandable as to why this criterion is ranked lower by the Hong Kong respondents. Emphatically, most of the past PPP projects in Hong Kong had not suffered so much from public and political protests. Some examples include the Cross Harbour Tunnel initiated in 1969; the Asia World Expo project, which opened in 2005; and the Hong Kong Disneyland Theme Park, which also opened in 2005.

The success criterion, 'reduced litigations and disputes' is ranked ninth in Ghana, whereas the Hong Kong respondents ranked it thirteenth; this is a large mean difference of 0.97 (i.e., 3.55 in Ghana and 2.58 in Hong Kong). In Ghana's PPP practice, litigations and disputes in PPP arrangements stem from the lack of experience of contracting authorities in contract negotiations. This is because, very often, public officials agree on contract terms that are not in the interest of the general public and, more importantly, they retain excessive risks and responsibilities. In the long term, these actions result in litigations and disputes, which subsequently end up in high unplanned costs, contract abrogation, and reputation and relationship damage (Cisse, Menon, Segger, & Nmehielle, 2013). Practically, within the Ghanaian context, it may be difficult to completely eliminate litigations and disputes in PPPs; however, their occurrence could be reduced to the lowest level. Ideally, a well-structured and defined dispute resolution mechanism will help achieve a reduced number of litigations and disputes in PPP contracts (Osei-Kyei et al., 2017).

Unlike Ghana, Hong Kong is not completely new to the concept of PPP. Importantly, the private sector has played a very active role in developing Hong Kong's economy compared with that in Ghana. When it comes to contract negotiations, their public authorities are experienced enough to engage in fruitful negotiation processes. This, therefore, has helped

to minimize litigations in most of their past PPP arrangements, including the Cross Harbour Tunnel, Asia World Expo, and Hong Kong Disneyland projects. Notwithstanding, Hong Kong has a well-organized legal system, which deals with litigations and disputes in a cordial manner compared with that in Ghana. These are the possible reasons why Hong Kong may not place more emphasis on reduced litigations and disputes when measuring PPP project success.

Local economic development is ranked eighth in Ghana and fifteenth in Hong Kong. In essence, there is a large mean difference of 1.33 (i.e., 3.56 in Ghana and 2.23 in Hong Kong). Local economic development refers to the economic benefits associated with PPP projects, which includes employment opportunities and easy access to public facilities by local commuters (Osei-Kyei et al., 2017). Emphatically, some of the motives of the Ghanaian government engaging in PPPs include solving the huge infrastructure deficit and creating more job opportunities for the people of Ghana (World Bank, 2009). Unemployment and pressure on public facilities are very high in Ghana due to the rapid urbanization growth rate. The current unemployment rate in Ghana among youth stood at 8.70% in 2013 (World Bank, 2015). In addition, the infrastructure deficit in Ghana requires an annual expenditure of US\$1.5 billion (World Bank, 2009). The PPP concept is therefore viewed by the government as a means to reducing the unemployment rate and bridging the infrastructure gap. With PPP projects, different job opportunities requiring both skilled and unskilled labor, are often created (Osei-Kyei et al., 2017).

In Hong Kong, it is understandable why local economic development is not a critical PPP project success criterion. Obviously, Hong Kong is one of the jurisdictions in the world with rapid infrastructure growth and a low unemployment rate (i.e., 3.4% as of 2016) (Census and Statistics Department, 2016); therefore, PPP implementation

is not perceived to be very impactful in terms of reducing unemployment and boosting infrastructure growth as that seen in Ghana. It is worth noting, however, that although past projects may have contributed to the economic development of Hong Kong in terms of providing job opportunities, local economic development is not necessarily an important criterion in judging the success of PPP projects in Hong Kong. In essence, other criteria are more critical than this criterion based on the ranking.

The success criterion, 'effective technology transfer and innovation' is ranked twelfth by respondents from Ghana and fourteenth by their Hong Kong counterparts. Although this ranking is quite close, the mean difference is large (i.e., 3.36 in Ghana and 2.38 in Hong Kong). A study conducted by Osei-Kyei et al. (2014) pointed out that technology transfer and innovation in PPPs is one of the reasons for PPP implementation in Ghana. In Ghana, the direct foreign investment in infrastructure development is gradually increasing. As of 2008, 9.52% of the total GDP came from direct foreign investment in infrastructure in different economic sectors (Global Economy, 2016). Essentially, the government aims to use PPP schemes to help local practitioners, so that they can benefit from the skills and expertise of international firms (Ministry of Finance and Economic Planning, 2011). Certainly, in the long term, local practitioners will be equipped with the skills and knowledge, which will enable them to undertake large-scale projects or partner with other international firms; this will therefore expand the local PPP market and enhance the practice of PPPs.

In Hong Kong the issue of technology transfer to local enterprise is not as critical as that seen in Ghana (Cheung et al., 2012). This is because most of the past PPP projects in Hong Kong have been undertaken by local practitioners who have adequate experience. A typical example of such projects

is the Cyber Port PPP Project, constructed and managed by the Pacific Century Group (Lee, 2005). In support of this finding, Li et al. (2005a) also emphasized that technology transfer is certainly not relevant in the United Kingdom because of the rich experience of local practitioners' in delivering private finance initiative PFI projects.

Effective risk management, reduced public sector administrative cost, reduced project life cycle cost, and satisfying the need for public facility and/or service are ranked higher in Hong Kong than in Ghana. In essence, they directly relate to the efficiency in the cost and service delivery of PPP projects. This outcome is not surprising, because a study conducted by Cheung, Chan, and Kajewski (2010) identified efficiency-related factors as the important reasons for PPP implementation in Hong Kong. Effective risk management is ranked third by Hong Kong respondents, whereas their Ghanaian counterparts ranked it sixth. This success criterion encompasses the proper identification, equitable allocation, and effective treatment of risks (Osei-Kyei et al., 2017). Certainly if risks are properly managed, the overall cost of the project is reduced, which therefore enhances cost efficiency.

In recent times, risk management has become very important in Hong Kong's PPP practice because of the experience of past projects, including the Western Harbour Crossing project. In the Western Harbour Crossing project, the demand and/or market risk was fully allocated to the private investor, who had no adequate mitigation measures for such risk because of the existence of alternative routes (Tam, 1999). Ideally, the demand and/or market risk should have been shared among parties as seen in other PPP projects, such as the Hong Kong Disneyland Theme Park (Shen, Platten, & Deng, 2006). The misallocation of the demand and/or market risk in the project has caused serious financial loss to the private investor. In addition, there has been agitation by the general public

and members of the Legislative Council on toll hikes (Tam, 1999). Due to these previous experiences, managing risks effectively in PPP projects is a critical issue, which has been emphasized in the policy guideline for PPPs issued by the Efficiency Unit in Hong Kong (Efficiency Unit, 2008).

Unlike Hong Kong, effective risk management is not critical in Ghana. This is because Ghana has very little experience with PPP implementation, particularly for construction projects. Essentially, few projects have been implemented, with many projects still at the preparatory stages; therefore, there is little experience when it comes to risk management in PPPs. Importantly, as more projects are being implemented, effective risk management may become a critical issue such as that seen in Hong Kong.

Reduced public sector administrative cost and reduced project life cycle cost are ranked seventh and sixth in Hong Kong, respectively. In Ghana, these success criteria for PPP projects are ranked thirteenth and fourteenth, respectively; the mean difference between both countries is large for each criterion. In Hong Kong, the public sector incurs many administrative costs when procuring public projects. This is primarily because of the excessive risks retained by the public sector. Therefore, it is expected that through PPP, the public sector will transfer more risks to the private investor, thereby reducing the administrative cost of procuring public facilities. Similarly, public construction projects are very costly to procure and maintain in Hong Kong considering many factors, including the complexity of projects, and the lack of land and labor. Hence, PPP is considered as the ideal option to offer a more reduced project life cycle cost compared with the traditional bid-build procurement method (Efficiency Unit, 2008).

With respect to Ghana, public authorities do not incur much administrative cost when procuring some public projects. This is basically because public projects, including six-unit classroom

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blocks and public markets, are low complexity and do not have many risks as those seen in Hong Kong. Thus, the drive to use PPP as an ideal approach to reducing administrative costs when procuring most public projects is lacking.

Satisfying the need for public facility and/or service is ranked eighth by the Hong Kong respondents, whereas their Ghanaian counterparts ranked it fifteenth. Generally, conducting need analysis is required prior to PPP implementation; however, this has become more critical in Hong Kong because of the specific functions required of PPP projects implemented in Hong Kong. In essence, Hong Kong mostly has specific and special reasons for implementing specific PPP projects, which is unusual in Ghana. Projects may be implemented specifically to boost tourism or for information technology development. Emphatically, the needs for a PPP project in Hong Kong go beyond bridging the infrastructure gap and budgetary constraints. Because of this, the Efficiency Unit emphasized in their 2008 policy guideline for PPP that the need analysis of PPP projects must be carefully and effectively done prior to PPP implementation in Hong Kong. On the other hand, Ghana does not implement PPP projects with specific and special reasons as those realized in Hong Kong's PPP practice. The emphasis placed on

satisfying the specific need for PPP projects in Hong Kong is certainly not the same in Ghana. The specific and special expectations for PPPs in Hong Kong also include the usage of green technologies and sustainability measures in PPPs.

Similarities on the Ranking of PPP Project Success Criteria among Respondents from Ghana and Hong Kong

The similarities in the top and bottom rankings by respondents from Ghana and Hong Kong are identified using quartile groupings (Table 4). The mean values of PPP project success criteria are grouped into upper (i.e., 25% highest mean values) and lower (i.e., 25% lowest mean values) quartiles for each respondent group. The cut-off values for the upper quartile subsets are 4.14 and 4.15 for Ghana and Hong Kong, respectively. Furthermore, the cut-off values for the lower quartile subsets are 3.36 and 3.08 for Ghana and Hong Kong, respectively.

As shown in Table 4, the upper and lower quartile subsets of both jurisdictions contain four PPP project success criteria. In essence, the success criteria in both quartiles for each jurisdiction are the top and bottom four rankings of each group. In the upper quartile, three PPP project success criteria appeared in each group's subset, which implies that the three success criteria for PPP

projects are more likely to be ranked similarly by respondents from both countries. These criteria include adherence to budget, adherence to time, and meeting output specifications. Interestingly, these success criteria form part of the traditional success measures for general construction projects (Chan & Chan, 2004). Adherence to budget is ranked first in Hong Kong and third in Ghana; it has very close mean values of 4.23 and 4.42 for Ghana and Hong Kong, respectively. This criterion refers to meeting the estimated budget (i.e., construction and operational costs) of PPP projects (Osei-Kyei et al., 2017). Globally, it is acknowledged that procuring PPP projects could be very expensive and they require huge investment capital, considering the lengthy nature of their arrangements (Boussabaine, 2013). Thus, procuring PPP projects within the estimated budget is very critical to both public and private investors irrespective of culture and geographical differences. Essentially, when project parties procure PPP projects within the estimated budget, it enables them to set reasonable user fees.

In general, adherence to time is also an element of the traditional success measures of construction projects (Atkinson, 1999). It is ranked fourth in Ghana, whereas the Hong Kong respondents ranked it second. Furthermore, it has very close mean values for both

Quartiles	Ghana		Hong Kong	
	PPP Project Success Criteria	Mean	PPP Project Success Criteria	Mean
Upper Quartile $Q_3(\text{Ghana}) = 4.14$ $Q_3(\text{HK}) = 4.15$	Profitability	4.40	Adherence to budget	4.42
	Meeting output specifications	4.32	Adherence to time	4.35
	Adherence to budget	4.23	Effective risk management	4.27
	Adherence to time	4.14	Meeting output specifications	4.15
Lower Quartile $Q_1(\text{Ghana}) = 3.36$ $Q_1(\text{HK}) = 3.08$	Effective technology transfer and innovation	3.36	Reduced public and political protests	3.08
	Reduced public sector administrative cost	2.96	Reduced litigations and disputes	2.58
	Reduced project life cycle cost	2.84	Effective technology transfer and innovation	2.38
	Satisfying the need for public facility/service	2.70	Local economic development	2.23

Note: Quartiles cut-off values are calculated using the Quartile function in MS Excel.

Table 4: Quartile groupings of PPP project success criteria in Ghana and Hong Kong.

countries (i.e., 4.14 in Ghana and 4.35 in Hong Kong). Basically, time is very critical in PPP project delivery. This is because the earlier the investor completes the project, the faster the project parties are able to start operation and recoup their investment returns. This is one of the fundamental reasons why many PPP projects around the world are often completed either before or on time (Osei-Kyei & Chan, 2015b; Kumaraswamy & Zhang, 2001). In essence, adhering to time makes the public facility available for usage by the general public earlier; in this regard, irrespective of cultural and geographical differences, adherence to time in PPPs is beneficial to both the project parties and users.

Meeting output specifications is ranked second and fourth by respondents from Ghana and Hong Kong, respectively. Similarly, it has very close mean values for both respondent groups (i.e., 4.32 in Ghana and 4.15 in Hong Kong). This success criterion refers to meeting the expected output requirements and/or standards of a facility (Osei-Kyei et al., 2017). In PPP project arrangements, output-based specifications are provided rather than input specifications (Lam & Javed, 2015). This is done so that the investor can adopt innovative and creative approaches in delivering the project. In traditional bid-build procurement projects, this PPP project success criterion may be labeled as quality or meeting technical specifications (Chan & Chan, 2004). Emphatically, meeting output specifications enhances user satisfaction, thereby reducing user agitation. Project parties and users, irrespective of cultural and geographical differences, thus greatly benefit when the output specifications of a PPP project are fully met.

In the lower quartile section, 'effective technology transfer and innovation' appeared in each respondent group's subsets. This criterion has been identified as having significant differences in mean values between the

two respondent groups (see Table 3); however, its position in each respondent group's ranking is lower. This is understandable because, in general, respondents from Ghana ranked the set of PPP projects success criteria a little higher than their Hong Kong counterparts, which implies that respondents from Ghana considered more of the success criteria important compared with their Hong Kong counterparts. Thus, although a criterion may have a higher mean value in Ghana, it could be ranked lower among the set of 15 success criteria as realized with effective technology transfer and innovation. Notwithstanding, the ranking of this criterion implies that both countries do not consider it as critical when compared with other success criteria; it is, however, more irrelevant in Hong Kong than in Ghana.

Conclusion

This article has empirically compared the criteria for measuring the success of PPP projects in developing and developed countries, using Ghana and Hong Kong as examples. An empirical questionnaire survey was undertaken in both countries with relevant experienced PPP practitioners. The Kendall's concordance analysis, mean score ranking, Mann-Whitney U test, and quartile groupings were used for analysis. The results from the Kendall's concordance test indicated the agreement and consistency on the ranking of factors (i.e., PPP project success criteria) within each respondent group. The mean ranking analysis shows that respondents from Ghana ranked the factors similarly as their Hong Kong counterparts. Additionally, nine project success criteria for PPP projects emerge as critical in Ghana, whereas seven PPP project success criteria are critical in Hong Kong. The significant test results reveal nine PPP projects success criteria with varying levels of importance among respondents from the two independent groups. Emphatically, those that are ranked higher in

Ghana and lower in Hong Kong relate to dispute minimization and the social and economic developments associated with PPP projects. These include: profitability, reduced public and political protests, reduced litigations and disputes, local economic development, and effective technology transfer and innovation. On the other hand, criteria that are ranked higher in Hong Kong and lower in Ghana directly relate to the efficiency in cost and service delivery of PPP projects, which include effective risk management, reduced public sector administrative cost, reduced project life cycle cost, and satisfying the need for public facility and/or service. Similarities in the top and bottom rankings were identified using quartile groupings (i.e., upper quartile (top ranking) and lower quartile (bottom ranking)). The results reveal that adherence to budget, adherence to time, and meeting output specifications are very critical in both countries. On the contrary, effective technology transfer and innovations are of low importance in both countries, particularly in Hong Kong.

The outputs of this study contribute substantially to the knowledge on the international best practices of PPP. Moreover, international developers and public authorities in both developing and developed countries can be informed of the core areas where resources need to be channeled in order to achieve success. More importantly, practitioners in developing and developed countries will have the opportunity to evaluate whether or not their projects have been successful.

The major limitation of this study lies in the fact that low samples are used for comparison; therefore, the results cannot be readily generalized. However, considering that the majority of respondents have a reasonable number of years of research and/or industrial experience in PPPs in their respective jurisdictions, the research outputs are still significant and valuable for future reference.

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