

Gap Analysis of Factors Affecting Tendering Phase of PPP Projects in Nigeria

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Tendering phase as a key factor for PPP projects is complicated and has some major problems including lengthy negotiation time and high cost. The CSFs identified at other stages do not address these issues of the tendering stage. In order to ensure the success tendering stages of PPP projects in the construction industry, this paper conducted a gap analysis of the importance level of CSFs for the tendering stages of PPP projects in Nigeria. Using a survey design, the participation, level of knowledge, and experience of professionals involved in the tendering stages of PPP projects, as well as the expected and observed significance of CSFs, were evaluated. To sample professionals' opinions in the study area, a closed-ended questionnaire was used. Quadrant and gap analyses were used to analyse the collected data. The research reveals a high level of expected importance for CSFs in the bidding stages of PPP projects but a lower level of observed importance. In addition, the study provided recommendations for bridging the sustainability gap between tendering stages and PPP initiatives in general. This paper reaches the conclusion that there is a disparity between the expected and observed importance of CSFs in the tendering stages of PPP projects and discusses the CSFs that required attention but did not receive it. These CSFs, if observed as expected during the tendering phases of PPP projects, will improve the private-public relations of PPP stakeholders and the probity of the processes.

Keywords: PPP, CSFs, tendering phase, gap and quadrant analysis, Nigeria

INTRODUCTION

Over the last couple of decades, global population have grown, leading to an increase in the need for infrastructure (Otairu *et al.*, 2014). Recent global estimates show how much investment is needed to meet the needs of economic growth, urbanisation, and rising populations (Palcic *et al.*, 2022). The Organisation for Economic Cooperation and Development (OECD) estimates that total global infrastructure investment needs in key sectors like housing, transportation, electricity generation, transmission and distribution, water, and telecommunications will cost US\$71 trillion, or about 3.5% of annual world GDP, from 2007 to 2030 (Otairu *et al.*, 2014). Governments have turned to public-private partnerships to pay for much-needed infrastructure while also meeting their many other responsibilities to their people. According to the World Bank *et al.* (2014), a public-private partnership is a long-term deal between the private sector and a government body to provide public assets or services. The private sector takes on most of the risks and management duties, and payment is based on how well the public asset or service is done.

Bao *et al.* (2018) asserted that because PPP projects are so complicated, different government agencies and organisations [the World Bank, Asian Development Bank (ADB), Department of Infrastructure and Regional Development (DIRD) of Australia, and European Investment Bank (EIB)] have made rules for creating and maintaining PPP projects, and the Infrastructure

Concession Regulatory Commission (ICRC) has been set up to oversee PPP projects and their finances.

As a stage in procurement of infrastructural projects, tendering is an important part of PPP. However, Chan *et al.* (2005) reported that it is also complicated and hard because most of the important decisions are made at this stage. Almarri and Abuhijleh (2017) also noted that the tendering process starts when interested bidders get an invitation for an Expression of Interest (EOI). According to Chan *et al.* (2009) and Simon *et al.* (2020), the tendering process can be long and expensive, which affects the value for money of the whole project. According to Liu *et al.* (2016), the critical success factors found at different stages of PPP projects cannot be used at the tendering stage of the project. These success factors can only solve complex organisational problems when they work together (Van Tiem *et al.*, 2012; Denolf *et al.*, 2015). To ensure the appropriate use CSFs at the tendering stages of PPP projects, Simon *et al.* (2020) created a theoretical success factor framework for managing the tendering phase of PPP projects.

As emphasised by Abdel-Aziz (2007), PPP is country-specific, as each country has its own different PPP context, and PPP in developing countries should be considered differently because of unstable economic conditions and immature PPP markets (Ameyaw and Chan, 2016). Thus, notwithstanding studies (Babatunde *et al.*, 2012; Babatunde *et al.*, 2018; Muhammad & Johar, 2018; Dahiru & Muhammad, 2015) carried out to identify the critical success factors of PPP in Nigeria, limited

studies in the Nigerian context have been carried out on the interactions of critical success factors in the tendering stages of PPP infrastructure projects. This study, which will do a gap analysis of critical success factors for the tendering stage of PPP infrastructure projects in Nigeria, was inspired by this lack. The fact that Nigeria is a developing country with a lot of PPP projects has made it possible for this study to be done. Since the study looked at critical success factors for PPP projects, it will help make sure that the success of PPP projects is based on successful tendering steps. Since most important decisions are made during the bidding process, the results would also help people make good choices.

LITERATURE REVIEW

The critical success factors (CSFs) are those limited areas in the organization’s activities that could result in the organization’s success and performance (Kwak *et al.*, 2009). According to Chien (2014), this concept could be traced back to the 1960’s when it was initiated and used as “success factors”. The concept of critical success factors has been investigated by many authors on PPP projects (Jefferies, Gameson & Rowlinson, 2002; Li *et al.*, 2005; Cartligde, 2006; Jacobson & Choi, 2008; Cheung, 2009; Agrawal, 2010; Minnie, 2011; Chou *et al.*, 2012; Ng, Wong & Wong, 2012; Cheung, Chan & Kajewski, 2012; Tang *et al.*, 2013; Ismail, 2013; Wibowo & Alfen, 2014; and Ameyan & Chan, 2015). Sanni (2016), through a review, reported that CSFs such “strong private consortium” and “appropriate risk allocation and sharing”, amongst others, were identified to have greater impact on private sector participants in the implementation of PPP projects. It further revealed that two factors which were identified as key factors for the delivery of PPP projects by the public sector were the alignment with government’s strategic objectives and strong political support. However, the commitment and responsibility of public/private sectors, true partnership,

and open communication were mutually consented to by public and private sectors’ participants in PPP projects’ implementation. This study, while considering the outcome of this review, has investigated the levels of importance of CSFs as they occur in the tendering stages of PPP projects.

The topic of critical success factors (CSFs) has become popular among PPP researchers. Osei-Kyei and Chan (2015) summarised the findings of the PPP CSFs studies from 1990 to 2013. For the classification of CSFs, Jefferies (2006) identified CSFs from different groups such as project company, main contractors, investors, operators, and host government. Aerts *et al.* (2014) divided the CSFs into the following categories: economic, financial, legal, political, procedural, social, structural, and technical factors. Liu *et al.* (2015) identified CSFs by the phases (initiation and planning, procurement, and partnership) of PPP infrastructure projects. Chou and Pramudawardhani (2015) set up the following five groups of CSFs: stable macroeconomic environment, shared responsibility between public and private sectors, transparent and efficient procurement process, stable political and social environment, and judicious government control.

Although there are success factors for PPP projects in the World bank *et al.*’s (2014) guidelines, each part of a PPP project is different in its own way, as seen in the CSFs classifications. So, studies (Raisbeck & Tang, 2013; Ng *et al.*, 2012; Tang & Shen, 2013; Hwang *et al.*, 2013; Tanga *et al.*, 2013; Liu *et al.*, 2015; Ose-kyei *et al.*, 2015; Opawole & Jagboro, 2018; Debela, 2019) looked at the factors that affect PPP at different stages, such as the feasibility stage. Liu *et al.* (2016) and Simon *et al.*, (2020) identified CSFs affecting the tendering stages of PPP projects to further mitigate the peculiarities of the different phases of PPP projects. These CSFs are shown in Table 1.

Table 1: CSFs Affecting the Tendering Phase of PPP Projects.

SUCCESS FACTORS		AUTHORS
1	Adequacy and efficiency of probity processes	(Templeman & Paradise, 2006; Liu <i>et al.</i> , 2016)
2	Availability of ex-post evaluation and auditing	(Garvin, 2010; Mahalingam, 2010; Liu <i>et al.</i> , 2016)
3	Availability of PPP guidelines and standardized documentation	(Li <i>et al.</i> , 2005a; Aziz, 2007; Garvin, 2010; Mahalingam, 2010)
4	Maintaining competitiveness while streamlining tenders	(Qiao <i>et al.</i> , 2001; Dixon <i>et al.</i> , 2005; Li <i>et al.</i> , 2005a; Liu <i>et al.</i> , 2016)
5	Capacity to adopt new technologies	(Choen <i>et al.</i> , 2009; Mohemad <i>et al.</i> , 2010; Adedeji <i>et al.</i> , 2017; Morozova, 2019)
6	Choice of the tendering procedure	(Jefferies, 2006; Boussabaine, 2013; Iossa, 2015; Iossa & Martimort, 2016; Gao & Liu, 2019)
7	Clarity and responsiveness of governance structures	(Li <i>et al.</i> , 2005; Liu <i>et al.</i> , 2015; Liu <i>et al.</i> , 2016; Hsueh & Chang, 2017)
8	Clarity of duties	(Goold & Campbell, 2003; Jacobson & Choi, 2008; Pardo <i>et al.</i> , 2009; Tang <i>et al.</i> , 2013; Osei-Kyei & Chan, 2015)

9	Community engagement	(Jefferies, 2014; Torvinen & Ulkuniemi, 2016; Hsueh & Chang, 2017)
10	Compensation of losing bidders	(Ho & Hsu, 2014; De Clerck & Demeulemeester, 2016b)
11	Constant dialogue with key market players	(Liu <i>et al.</i> , 2016)
12	Cost of tendering	(Chan <i>et al.</i> , 2005; Zitron, 2006; De Schepper <i>et al.</i> , 2015b)
13	Depth of market sounding	(Zou, 2015; Liu <i>et al.</i> , 2016)
14	Efficiency of approval process	(Liu & Wilkinson, 2013; Casady <i>et al.</i> , 2019)
15	Efficiency of communication process	(Liu <i>et al.</i> , 2015; Liu <i>et al.</i> 2016; Hsueh & Chang, 2017)
16	Interface efficiency	(Chan <i>et al.</i> , 2005; Liu <i>et al.</i> , 2015; Meng & Boyd, 2017)
17	Efficiency of negotiation process	(Jefferies, 2006; Boussabaine, 2013; Iossa, 2015; Liu <i>et al.</i> , 2015; Iossa & Martimort, 2016)
18	Involvement of public officials and leadership	(Liu <i>et al.</i> , 2016)
19	Involvement of the end-user	(Ernst & Young, 2008; Torvinen & Ulkuniemi, 2016)
20	Knowledge management	(Love <i>et al.</i> , 2004; Chan <i>et al.</i> , 2005)
21	Learning mechanisms	(Lam & Javed, 2015; Hsueh & Chang, 2017; Van den Hurk & Verhoest, 2017)
22	Management capability	(Meng & Boyd, 2017)
23	Performance measurement	(Ernst & Young, 2008; Liu <i>et al.</i> , 2015; Liu <i>et al.</i> , 2018)
24	Private consortium capability and organization	(Zhang, 2005; Osei-Kyei & Chan, 2015)
25	Private consortium experience	(Osei-Kyei & Chan, 2015)
26	Private Consortium individual skills	(Chan <i>et al.</i> , 2005; Liu <i>et al.</i> , 2015)
27	Public sector individual experience and knowledge	(Kwak <i>et al.</i> , 2009; Liu <i>et al.</i> , 2015; Liu <i>et al.</i> , 2016; Casady <i>et al.</i> , 2019)
28	Public sector's commitment to PPP tendering	(Liu <i>et al.</i> , 2016; Robinson & Scott, 2009)
29	Quality of risk repartition	(Jefferies, 2014; De Clerck & Demeulemeester, 2016; Firmenich & Jefferies, 2016)
30	Quality of the documentation	(Liu <i>et al.</i> , 2016; Zhang, 2004; Ernst & Young, 2008; Yescombe, 2011; Zou <i>et al.</i> , 2008)
31	Robustness of procurement option analysis	(Yescombe, 2011; Zou <i>et al.</i> , 2008)
32	Transparency of tendering process	(Zhang, 2004; Liu <i>et al.</i> , 2015; Hsueh & Chang, 2017)

(Source: Liu *et al.*, 2016; Simon *et al.*, 2020)

RESEARCH METHODOLOGY

This study conducted a gap analysis of critical success factors for the tendering stages of PPP infrastructure projects in Nigeria. Since this study is based on past works that have created rules, laws, and theories to assist in determining factual data, analysing links between facts, and determining how such facts relate to hypotheses and prior research findings through mathematical models for data analysis, the quantitative research approach is best suited for this study (Liu *et al.*, 2016).

For data collection, a questionnaire survey was used to gather information from PPP project professionals involved in the tendering phases of PPP projects in Nigeria. The population for this study was all PPP initiatives in Nigeria as of 2021. To achieve the aim of this study, noting that professionals who were actively involved in the tendering phase of PPP projects are required to respond to the questionnaires, the purposive sampling technique was used. The exact number of PPP

projects in Nigeria, 233 (ICRC, 2021), was used to determine the sample size for this study using Glenn's (1992) table with 10% precision, 95% confidence, and $P = 0$. The sample size was determined to be 72 based on the table. Following Salkind's (1997) recommendation that when mailing surveys or questionnaires, the sample size should be increased by 40%–50% to account for lost mail and uncooperative subjects, a total of 100 questionnaires were sent to survey respondents (72 plus 40% of 72) to lessen loss of questionnaires and botched retrievals. The retrieval of 70 valid questionnaires indicated an effective response rate of 70%.

The research instrument used was a structured questionnaire with closed-ended questions, whose design was informed by the findings of a review of the relevant literature. The questionnaire was divided into two sections, with the initial section focused on the respondents' background information and the later focused on the respondents' responses to the importance

of the CSFs in tendering stages of PPP projects under expected and observed situations. On a five-point Likert scale (very high = 5, high = 4, average = 3, low = 2, and little or none = 1), respondents were asked to rate the expected and observed importance of each critical success factor (CSF) at the tendering stage of PPP projects.

Frequency and percentage were used to analyse the background information, while mean value analysis (MVA) was used to determine the importance of CSFs and the engagement of each CSF during the tendering phase of PPP projects. Similar to Oke and Otasowie's (2020) research, a gap analysis was employed to compare the required (expected) importance of CSFs with the extent to which these CSFs were taken into account (observed) during the tendering stage of PPP projects. Subsequently, a quadrant analysis was conducted using the average means of the expected importance and observed importance of the CSFs in Table 3 to group the CSFs into quadrants.

RESULTS AND DISCUSSION

Background Information

Table 2 shows that 85% of respondents have six or more years of experience in PPP-related initiatives, and 70% have more than ten years of experience. This indicates that respondents have a great deal of experience in PPP activities and therefore possess the knowledge required to contribute to this study. Considering Akinnusi *et al.*'s (2017) recommendation on the minimum decision-making qualification, majority of respondents (82.9%) hold BSc and MSc degrees, demonstrating the required knowledge and experience in higher management for this study. Furthermore, it is important to note that 42.9% of the respondents are procurement officers by profession. Due to the complexity and sensitivity of the concessionary process, this indicates the participation of procurement officers in PPP projects, especially during the tendering stages. In addition, 78.6% of respondents have participated in six or more PPP projects, indicating a high level of knowledge and experience with regard to PPP projects.

Table 2: Background information

Respondents' Information	Frequency	Percentage
Level in organisation:		
Top level	21	30
Middle level	33	47.5
Low level	16	22.5
Years in service:		
1- 5 years	10	14.3
6-10 years	11	15.7
11-15 years	23	32.9
16-20 years	17	24.3
Over 20 years	9	12.9
Educational level:		
HND	6	8.6
BSC	30	42.9
MSC	28	40
PHD	6	8.6
Profession:		
Architect	13	18.6
Quantity surveyors	16	22.9
Civil Engineers	11	15.7
Procurement officers	30	42.9
No of PPP Projects:		
1-5 projects	15	21.4
6-10 projects	12	17.1
11-15 projects	16	22.9
16-20 projects	14	20
Above 20	13	18.6

Importance of CSFs at Tendering stage of PPP Projects

Table 3 ranks CSFs' influence on PPP projects at tendering stages. Private consortium experience has an expected mean score of 4.33, making it the CSFs with the highest expected importance mean rating. This finding supports twelve papers from 1990 to 2013 who found out that public-private partnerships succeed with well-organised and trustworthy private consortia (Osei-Kyei & Chan, 2015) and further corroborates the findings of Sanni's (2016) review. The consortium must complete the PPP project technically, managerially, and financially (Zhang, 2005), thus requiring experience to ensure these essential qualities.

Furthermore, "Transparency of the tendering process," "private consortium capability and organisation," "efficiency of the approval process," and "management capability" are the five most important CSFs affecting PPP tendering. PPP tendering processes lack transparency, especially in corrupt countries (Owusu *et al.*, 2020). Zou (2008) noted that transparent and accountable bidding processes affect public interests, which are central to PPP efforts. This further supports Liu *et al.*'s (2016) assertion that a transparent bidding procedure is essential to bidding success. Tendering requires efficient approvals which can be realised when the public sector gets advisors or consultants to gain competence in taxes, accounting, legislation, and the environment (Chan *et al.*, 2005; Liu *et al.*, 2015; Debela, 2019). Casady *et al.* (2019) recommended obtaining project-wide permissions, before contracting, to limit the likelihood of unplanned events. Management can also improve individual capacities through collaborative processes (Garvin, 2013).

All 33 factors have a mean score above 2.5, exceeding 50% of the maximal rank of 5. Thus, all parameters are expected to have moderate or high level of importance during PPP tendering stages.

Level of Observed importance of CSFs at Tendering stage of PPP Projects

PPP projects have been reported (Grimsey & Lewis, 2007; Li *et al.*, 2005a; Liu & Wilkinson, 2011) to have faced a lot of roadblocks, despite the global interest. The implementation of the PPP policy has been gradual, and there has been an increase in the number of failed or troubled projects, particularly in developing nations (Shendy, 2011; Osei-Kyei & Chan, 2015; Chan *et al.*, 2010; Liu & Wilkinso, 2011). These reports are further supported by the observed level importance (Table 3) attached to the CSFs at tendering stages of PPP projects by stakeholders. CSFs at tendering stages of PPP projects are responded to with an average importance not exceeding "4.00". This indicates that, in reality, the expected importance is less adhered to. The way and

manner risk are repartitioned was ranked topmost in the real-life situation. This revealed that the negotiation processes involve a trade-off between value for money to the private sector and the amount of risk transferred to the private entity (Lane & Gardiner, 2003). "Public sector's individual experience and knowledge" and "Quality of the documentation" were also ranked amongst the topmost CSFs at tendering stages of PPP projects, as observed. Similar study (Casady *et al.*, 2019) conducted in Canada revealed that the length of the tendering phase in PPP projects tend to shorten as the public sector gains experience with PPP procurement. More so, this study further supports the findings of Kwak *et al.* (2009) and Liu *et al.* (2015 and 2016) with a view towards ensuring that tendering processes requires skilled staff, which can be aided by training and learning tools.

It is worth noting that though both "Transparency of tendering process" and "private consortium individual skills" are in the top ranked observed CSFs importance; they are revealed to have lower impact as against the expected level of importance. More so, although training and learning tools have been proposed for improving public staff skills (Liu *et al.*, 2015), the last three (3) ranked observed CSFs importance at tendering stages of PPP projects have proved antagonistic to the same proposal.

Gap Analyses of CSFs Level of Importance at Tendering Stages of PPP projects

Five (5) CSFs with the largest mean importance gaps are "learning mechanism", "private consortium experience", "Private consortium capability and organisation", "Balance between streamlining tender processes and maintaining competition" and "Interface efficiency" with gap mean scores of 2.47, 1.81, 1.65, 1.43 and 1.41, respectively. These CSFs are crucial for the success of PPP projects as the findings connote that stakeholders at tendering stages of PPP projects do not consider these CSFs as they are expected to or as they ought to.

The five (5) CSFs with the least gap mean of importance are all directly related to the public-private relationship. This indicates that the importance of CSFs surrounding mutual benefits are consciously considered during the tendering stages of PPP projects to reduce the probability of future conflict. Since PPP is structured in a way that it is intended to provide greater flexibility to achieve the provision on public infrastructure objectives by altering traditional public and private sector roles with a view to taking better advantage of the skills and resources that private sector firms can provide (HM Treasury, 2012), the findings of this study have buttressed close relationship compromises between the public and private sector. This further corroborates Johannessen *et al.* (2013) who stated that PPP allows the costs and benefits for development to be better shared between private and public sectors.

Table 3: Gap Analysis on Expected and Observed importance of CSFs

Code	Factors	Expected		Observed		Gap	
		mean	rank	mean	rank	mean	rank
CSF1	Learning mechanisms	3.71	16	1.24	33	2.47	1
CSF2	Private consortium experience	4.43	1	2.62	20	1.81	2
CSF3	Private consortium capability and organization	4.00	3	2.35	14	1.65	3
CSF4	Balance between streamlining tender processes and maintaining competition	3.63	22	2.20	30	1.43	4
CSF5	Interface efficiency	3.77	10	2.36	28	1.41	5
CSF6	Compensation of losing bidders	2.60	33	1.23	17	1.37	6
CSF7	Community engagement	3.83	9	2.57	24	1.26	7
CSF8	PPP guidelines and standardized documentation	3.77	13	2.51	27	1.26	7
CSF9	Choice of the tendering procedure	3.54	24	2.29	29	1.25	9
CSF10	Efficiency of negotiation process	3.83	8	2.62	20	1.21	10
CSF11	Involvement of the end-user	3.74	14	2.54	25	1.20	11
CSF12	Efficiency of approval process	3.94	4	2.78	16	1.16	12
CSF13	Capacity to adopt new technologies	3.77	12	2.62	20	1.15	13
CSF14	Private Consortium individual skills	3.54	23	2.40	5	1.14	14
CSF15	Performance measurement	3.77	11	2.68	19	1.09	15
CSF16	Adequacy and efficiency of probity processes	3.83	7	2.84	32	0.99	16
CSF17	Robustness of procurement option analysis	3.43	30	2.54	25	0.89	17
CSF18	Depth of market sounding	2.89	32	2.03	6	0.86	18
CSF19	Transparency of tendering process	4.26	2	3.41	4	0.85	19
CSF20	Management capability	3.94	5	3.13	9	0.81	20
CSF21	Cost of tendering	3.37	31	2.61	23	0.76	21
CSF22	Clarity and responsiveness of governance structures	3.49	28	2.76	18	0.73	22
CSF23	Clarity of duties	3.69	17	2.96	13	0.73	23
CSF24	Knowledge management	3.63	20	2.97	12	0.66	24
CSF25	Availability of sufficient project pipelines	3.51	27	2.89	15	0.62	25
CSF26	Constant dialogue with key market players	3.51	26	2.99	11	0.52	26
CSF27	Availability of ex-post evaluation and auditing	3.63	21	3.19	31	0.44	27
CSF28	Efficiency of communication process	3.66	18	3.23	7	0.43	28
CSF29	Public sector's commitment to PPP tendering	3.49	29	3.08	10	0.41	29
CSF30	Quality of the documentation	3.83	6	3.45	3	0.38	30
CSF31	Involvement of public officials and leadership	3.51	25	3.20	8	0.31	31
CSF32	Public sector's individual experience and knowledge	3.71	15	3.51	2	0.20	32
CSF33	Quality of risk repartition	3.66	19	3.53	1	0.13	33
	<i>Average</i>	<i>3.66</i>		<i>2.71</i>		<i>0.96</i>	

Expected-Observed Importance Quadrant Analysis of CSFs for Tendering Stages of PPP Projects

Figure 1 shows the quadrant analysis of expected and observed importance of the CSFs affecting the tendering

stages of PPP projects. The quadrants (Q₁, Q₂, Q₃, and Q₄) were created using the average of group means of both the expected and the observed importance of the CSFs in table 3. CSFs with individual expected means

lower than the average expected group mean and individual observed mean lower than the average observed group mean form Q₁, as shown in figure 1. Similarly, CSFs in Q₂, Q₃, and Q₄ were classified into their respective quadrant, as the case may be, following a similar approach to that was used to classify CSFs in Q₁. CSFs in quadrant Q₃ were paid much attention to, although less attention should have been paid to them. This could lead to misplaced priorities and further affect the success of the tendering stages of PPP projects, negatively. Therefore, since PPP focuses upon efficiency, effectiveness and best value for money

through developing healthy partnerships between the public and private sectors (Handley & Gao, 2003), efforts spend on CSFSs in quadrant Q₃ (such as “involvement of public officials and leadership”) must be reviewed and redirected to CSFs in quadrant Q₂. Public officials’ interference in most construction businesses, especially those with unethical and corrupt professional practises lead to economic pressures, institutional opportunities, information lop-sidedness, and moral ills amongst contractors (Locatelli *et al.*, 2017 and 2022).

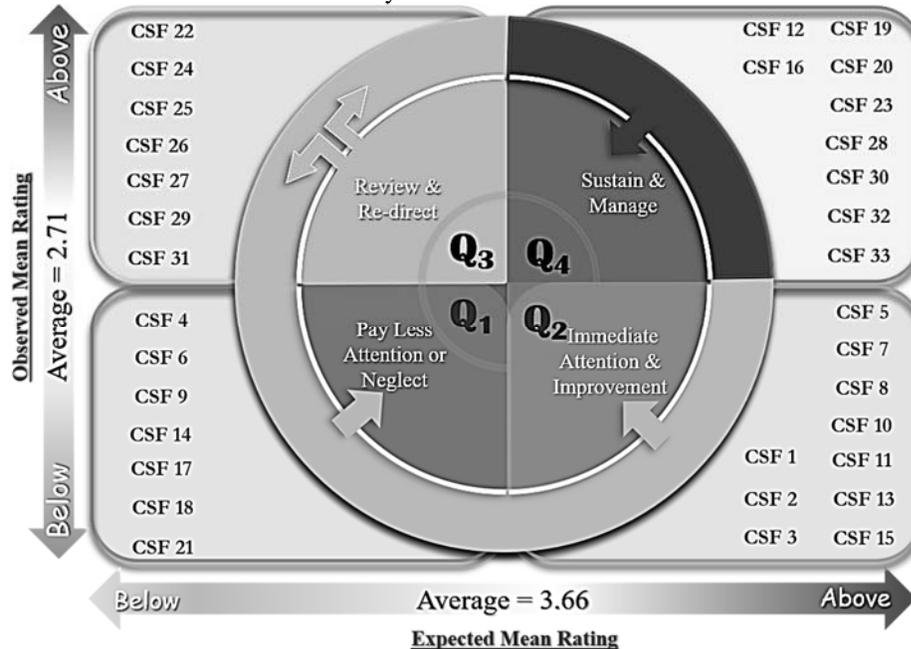


Figure 1: Expected-Observed CSFs Importance Quadrant Analysis

Quadrant Q₁ CSFs, like "compensation to losing bidders" and "cost of tendering" should be ignored. "Quality of risk reparation" and "Quality of documentation" (both in quadrant Q₄) have reduced the need for CSFs in quadrant Q₁, which focus on competition and tendering. The public sector's experience and commitment to probity in PPP project tendering border other CSFs in quadrant Q₄. To ensure sustainable PPP tendering procedures, quadrant Q₄ CSFs must be maintained and managed (Sanni, 2016). Quadrant Q₂ presents CSFs needing immediate attention and improvement. These CSFs, though highly required for successful PPP tendering processes, they got little or no attention. “Capacity to adopt to new technologies” and “performance measurement”, amongst others, cannot be overemphasized, especially in the 21st century where e-tendering, blockchain technology, smart contract and big data analytics are promoted more intently (Abdullahi *et al.*, 2022; Liu *et al.*, 2023). New technologies can promote project accessibility and performance measurement while also improving transparency and ensuring that everyone has access to the most up-to-date

and correct project material (Adedeji *et al.*, 2017; Morozova, 2019; Korhonen *et al.*, 2023).

CONCLUSION

Tendering is an important stage in PPP projects, but it is also complex and difficult due to the majority of the important decisions being made at this stage. To help lower the complexity and difficulty, a gap and Quadrant analysis was conducted to determine the expected level of importance (attention) required and the actual level of importance given to CSFs at the tendering stages of PPP projects. The study found that most of the professionals involved in the tendering stages of PPP projects are well experienced and knowledgeable but are at the middle management level. Private consortium experience and Transparency of tendering process were found to be the top CSFs that require the most attention, while Quality of risk repartition was considered topmost. Learning mechanisms were given the worst attention to the required, while CSFs with the least gap mean of importance were directly related to the public-private

relationship. The study recommends that more urgent attention should be given to CSFs such as Private consortium capability and organization, Interface efficiency, Community engagement, Capacity to adopt new technologies, and Performance measurement, in the manner given to Efficiency of approval process and Quality of risk repartition.

REFERENCES

- Abdel Aziz, A. M. (2007). Successful delivery of public-private partnerships for infrastructure development. *Journal of Construction Engineering and Management*, 133(12), 918–931.
- Abdullahi, B., Ibrahim, Y. M., Ibrahim, A. D. & Bala, K. (2022). Development of web-based e-Tendering system for Nigerian public procuring entities, *International Journal of Construction Management*, 22(2), 278-291. DOI: 10.1080/15623599.2019.1620492
- Aerts, G., Grage, T., Dooms, M., & Haezendonck, E. (2014). Public-private partnerships for the provision of port infrastructure: an explorative multiactor perspective on critical success factors. *Asian Journal of Shipping and Logistics*, 30 (3), 273–298.
- Agrawal, R. (2010). *Successful Delivery of Public-Private Partnerships for Infrastructure Development*. Unpublished PhD thesis, Jaypee Institute of Information Technology, India.
- Akinnusi, D. M., Sonubi, O. O. & Oyewunmi, A. E. (2017). Fostering Effective Workforce Diversity Management in Nigerian Organisations: The Challenge of Human Resource Management. *International Review of Management and Marketing*, 7 (2), 108-116.
- Almarri, K., & Abuhijleh, B. (2017). A qualitative study for developing a framework for implementing public-private partnerships in developing countries. *Journal of Facilities Management*, 15(2),170-189, <https://doi.org/10.1108/JFM-07-2016-0031>
- Ameyaw, E. E., & Chan, A. P. (2016). A fuzzy approach for the allocation of risks in public-private partnership water-infrastructure projects in developing countries. *Journal of Infrastructure Systems*, 22(3), 04016016.
- Babatunde, S. O., Opawole, A., & Akinsiku, O. E. (2012). Critical success factors in public-private partnership (PPP) on infrastructure delivery in Nigeria. *Journal of Facilities Management*, 10(3), 212-225.
- Babatunde, S. O., Perera, S., & Adeniyi, O. (2018). Identification of critical risk factors in public-private partnership project phases in developing countries: A case of Nigeria. *Benchmarking: An International Journal*, 26(2), 334-355.
- Bao, F., Chan, A. P., Chen, C., & Darko, A. (2018). Review of public-private partnership literature from a project lifecycle perspective. *Journal of Infrastructure Systems*, 24(3), 04018008.
- Cartlidge, D. (2006). *Public Private Partnerships in Construction* (1st Ed.). London: Taylor and Francis Group.
- Casady, C., Flannery, D., Geddes, R. R., Palcic, D., & Reeves, E. (2019). Understanding PPP tendering periods in Canada: A duration analysis. *Public Performance & Management Review*, 42(6), 1259-1278.
- Chan, A. P. C., Lam, P. T. I., Chan, D. W. M., Cheung, E., & Ke, Y. (2009). Privileges and attractions for private sector involvement in PPP projects. *In Challenges, opportunities and solutions in structural engineering and construction* (pp. 773-778). CRC Press.
- Chan, W. T., Chen, C., Messner, J. I., & Chua, D. K. (2005). Interface management for China's build-operate-transfer projects. *Journal of Construction Engineering and Management*, 131(6), 645-655.
- Debela, G. Y. (2019). Attractive factors of public private partnership (PPP) for road projects in Ethiopia. *Journal of Civil, Construction and Environmental Engineering*, 4(3), 59-68.
- Cheung, E. (2009). *Developing a best practice framework for implementing public private partnerships in Hong Kong*. PhD. Queensland University of Technology, Australia.
- Cheung, E., Chan, A. P.C. & Kajewski, S. (2012). Factors contributing to successful public private partnership projects: Comparing Hong Kong with Australia and the United Kingdom. *Journal of Facilities Management*, 10(1), pp.45-58.
- Chien, H. (2014). Identify the Critical Success Factors of Business Management in Taiwanese Veterans Home. *Universal Journal of Management*, 2(2), 49-63.
- Chou, J., Tseng, H. P., Lin, C. & Yeh, C. (2012). Critical Factors and Risk Allocation for PPP Policy: Comparison between HSR and General Infrastructure Projects. *Transport Policy*, 22, 36-48.
- Chou, J.S., & 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*, 33 (5), 1136–1150.
- Dahiru, A., & Muhammad, R. S. (2015). Critical success factors of public-private-partnership projects in Nigeria. *ATBU Journal of Environmental Technology*, 8(2), 52-63.
- Garvin, D. A. (2013). How Google sold its engineers on management. *Harvard business review*, 91(12), 74-82.

- Glenn, D. I (1992). Sampling the Evidence of Extension Program Impact. Program Evaluation and Organizational Development, IFAS, University of Florida.
- Grimsey, D., Lewis, M., (2007). Public private partnerships and public procurement. *Agenda*, 14 (2), 171–188.
- Handley-Schachler, M. & Gao, S.S. (2003). Can the Private Finance Initiative be used in Emerging Economies? - Lessons from the UK's Successes and Failures. *Managerial Finance*, 29(5/6), 36-51.
- Hwang, B. G., Zhao, X., & 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*, 31 (3), 424–433.
- Ismail, S. (2013). Critical success factors of public private partnership (PPP) implementation in Malaysia. *Asia-Pacific Journal of Business Administration*, 5(1), 6–19.
- Jacobson, C. & Choi, S. O. (2008). Success factors: public works and public-private partnerships. *International Journal of Public Sector Management*, 21(6), 637–57.
- Jefferies, M. (2006). Critical success factors of public private sector partnerships. *Engineering Construction and Architectural Management*, 13 (5), 451–462.
- Jefferies, M., Gameson, R. & Rowlinson, S. (2002). Critical Success Factors of the BOOT Procurement System: Reflection from the Stadium Australia Case Study. *Engineering, Construction and Architectural Management*, 9(4), 352-61.
- Johannessen, A., Rosemarin, A., Gerger Swartling, A., Han, G., Vulturius, G., & Stenström, T. A. (2013). *Linking Investment Decisions with Disaster Risk Reduction in Water Sanitation and Hygiene (WASH): The Role of the Public and Private Sectors, Potentials for Partnership and Social Learning*.
- Korhonen, T., Jaaskelainen, A., Laine, T., & Saukkonen, N. (2023, January). How performance measurement can support achieving success in project-based operations. *International Journal of Project Management*, 41(1), 102429. <https://doi.org/10.1016/j.ijproman.2022.11.002>
- Kwak, Y. H., Chih, Y. Y. & Ibbes, C. W. (2009). Towards a Comprehensive Understanding of Public Private Partnerships for Infrastructure Development. *California Management Review*, 51(2), 51-77.
- Lane, M. & Gardiner, J. (2003) Risk management and Insurance issues. In: Public Private Partnerships - a review of key issues, *European Construction Institute*, 61-70.
- Li, B., Akintoye, A., Edwards, P. J., & Hardcastle, C., (2005a). The allocation of risk in PPP/PFI construction projects in the UK. *International Journal of Project Management*, 23 (1), 25–35.
- Liu, J., Love, P. E., Davis, P. R., Smith, J., & Regan, M. (2015). Conceptual framework for the performance measurement of public-private partnerships. *Journal of Infrastructure systems*, 21(1), 04014023.
- Liu, J., Love, P. E., Smith, J., Regan, M., & Davis, P. R. (2015). Life cycle critical success factors for public-private partnership infrastructure projects. *Journal of Management in Engineering*, 31(5), 04014073.
- Liu, T., & Wilkinson, S. (2011). Adopting innovative procurement techniques. *Construction Innovation*, 11(4), 452–469.
- Liu, T., Wang, Y., & 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*, 34(4), 701-716.
- Liu, H., Han, S., & Zhu, Z. (2023). Blockchain technology toward smart construction: Review and future directions. *Journal of Construction Engineering and Management*, 149 (3), 10.1061/JCEMD4.COENG-11929
- Locatelli, G., Konstantinou, E., Gerdali, J. & Sainati, T. (2022). The Dark Side of Projects: Uncovering Slavery, Corruption, Criminal Organizations, and Other Uncomfortable Topics. *Project Management Journal*, 53(4), 327–330. DOI: 10.1177/87569728221105041
- Locatelli, G., Marian, G., Sainati, T. & Greco, M. (2017). Corruption in public projects and megaprojects: There is an elephant in the room! *International Journal of Project Management*, 35, 252-268.
- Minnie, J. A. (2011). *Critical Success Factors for Public-Private Partnerships in South Africa*. PhD. Stellenbosch University, South Africa.
- Morozova, I. A. (2019). Application of new information and communication technologies as a key criterion of highly effective public-private partnership. *In Perspectives on the Use of New Information and Communication Technology (ICT) in the Modern Economy* (pp. 393-398). Springer International Publishing.
- Muhammad, Z., & Johar, F. (2018). Critical success factors of public–private partnership projects: a comparative analysis of the housing sector between Malaysia and Nigeria. *International Journal of Construction Management*, 19(3), 257–269.
- Ng, S. T., Wong, Y. M., & Wong, J. M. (2012). Factors influencing the success of PPP at feasibility stage– A tripartite comparison study in Hong Kong. *Habitat International*, 36(4), 423-432.

- Opawole, A., & Jagboro, G. O. (2018). Compensation mechanisms for minimizing private party risks in concession-based public-private partnership contracts. *International Journal of Building Pathology and Adaptation*, 36(1), 93–120. <https://doi.org/10.1108/ijbpa-09-2017-0041>
- Osei-Kyei, R., & Chan, A. P. (2015). Developing Transport Infrastructure in Sub-Saharan Africa through Public-Private Partnerships: Policy Practice and Implications. *Transport Reviews*, 36(2), 170–186. <https://doi.org/10.1080/01441647.2015.1077288>
- Osei-Kyei, R., & Chan, A.P.C. (2015). Review of studies on the critical success factors for public-private partnership (PPP) projects from 1990 to 2013. *International Journal of Project Management*, 33(6), 1335–1346.
- Otairu, A., Umar, A. A., Zawawi, N. A. W. A., Sodangi, M., & Hammad, D. B. (2014). Slow Adoption of PPPs in Developing Countries: Survey of Nigerian Construction Professionals. *Procedia Engineering*, 77, 188–195. <https://doi.org/10.1016/j.proeng.2014.07.014>
- Owusu, E. K., Chan, A.P.C., & Shan, M. (2020). An Empirical Study on Construction Process Corruption Susceptibility: A Vignette of International Expertise. *Science and Engineering Ethics*, 26, 325-349.
- Palcic, D., Reeves, E., Flannery, D., & Geddes, R. R. (2022). Public-private partnership tendering periods: an international comparative analysis. *Journal of Economic Policy Reform*, 25(2), 156-172.
- Raisbeck, P., & Tang, L. C. (2013). Identifying design development factors in Australian PPP projects using an AHP framework. *Construction Management and Economics*, 31(1), 20-39.
- Salkind, N. J. (1997). *Exploring research* (3rd Ed.). Upper Saddle River, NJ: Prentice Hall.
- Sanni, A. O. (2016). Factors determining the success of public private partnership projects in Nigeria, *Construction Economics and Building*, 16(2), 42-55. DOI:
- Shendy, R. (2011). Toward better infrastructure: conditions, constraints, and opportunities in financing public-private partnerships in select African countries. World Bank Publications.
- Simon, L., Jefferies, M., Davis, P., & Newaz, M. T. (2020). Developing a theoretical success factor framework for the tendering phase of social infrastructure PPPs. *International Journal of Construction Management*, 20(6), 613-627.
- Singh, A. S., & Masuku, M. B. (2014). Sampling techniques and determination of sample size in applied statistics research: An overview. *International Journal of Economics, Commerce and Management*, 2(11), 7-22.
- Tang, L., Shen, Q., Skitmore, M. & Cheng, E. W.L. (2013). Ranked Critical Factors in PPP Briefings. *Journal of Management in Engineering*, 29(2), pp.164-71.
- Wibowo, A. & Alfen, H. W. (2014). Identifying macro-environmental critical success factors and key areas for improvement to promote public-private partnerships in infrastructure. *Engineering, Construction and Architectural Management*, 21(4), 383–402.
- World Bank, Asian Development Bank & Inter-American Development Bank (2014). *Public-Private Partnerships Reference Guide—Version 2.0*. World Bank, Washington, D.C.
- Zhang, X. (2005). Critical success factors for public-private partnerships in infrastructure development. *Journal of Construction Engineering and Management*, 131(1), 3-14.
- Zou, P. X., Wang, S., & Fang, D. (2008). A life-cycle risk management framework for PPP infrastructure projects. *Journal of Financial Management of Property and Construction*, 13(2), 123-142.