ANALYSIS OF CRITICAL SUCCESS SUB-FACTORS
FOR PUBLIC–PRIVATE-PARTNERSHIPS IN NIGERIA

Dada, M.O.[a*] and Oladokun, M.G.[b]

[a]Department of Building, University of Lagos, Nigeria
[b]School of Built Environment, Herriot Watt University, Edinburgh, United Kingdom

*Corresponding author: tobdad@yahoo.com/ mdada@unilag.edu.ng

ABSTRACT

In Nigeria, there has been an increasing campaign for and the use of the public-private-partnership (PPP) procurement strategy. This research sought to assess a number of critical success sub-factors (SSFs), identified in an earlier study, on some selected PPP projects from the perspectives of both the public and private sectors. The study also sought to test whether there is agreement between the two sectors in their rankings and perceptions of the SSFs. A questionnaire survey was conducted to elicit the perceptions of the respondents on success factors for PPP projects. A set of 120 questionnaires was administered on respondents who were directly responsible for managing and administering construction related PPP projects. Fifty-nine (59) questionnaires were retrieved. The questionnaire used some identified success sub-factors (SSFs) to elicit the rankings of respondents on the SSFs. The retrieved questionnaires were analysed using both descriptive and inferential statistical tools. The obtained rankings were investigated to test their agreement. The findings of the study suggest that there are significant differences in the perceptions of both the public and private sectors on the rankings of the SSFs on PPP projects in Nigeria. One major implication of the findings of the research is the perception gap between the private sector and public sector on the critical success sub-factors. This perception gap has the potential of affecting the acceptability and performance of PPP projects in the country. It is thus recommended that relevant stakeholders take measures to close this perception gap while formulating and/or implementing policies for PPP projects in Nigeria.

Keywords: *Critical success sub-factors, public-private-partnerships, procurement, Nigeria*

1   INTRODUCTION

New procurement paradigms such as the public-private-partnerships (PPP) are emerging to challenge and replace the traditional methods of procurement of public projects (Cheung & Chan, 2011; Adegoke, Olaleye & Araloyin, 2010; Forrer, Kee & Newcomer, 2010; Sarmento, 2010; Dada and Oladokun, 2008). The criticisms of the traditional method of procurement are known and documented in literature and research (Idoro, Iyagba & Odusami, 2007; Cartlidge, 2007; Odeh & Battaineh, 2002; Fleming & Koppleman, 1997; Dozzi, Hartman, Fidsbury & Ashrafi, 1996). Such issues include lack of single point responsibility, tendency to adversarial relationships, lack of utilisation of construction knowledge, backwardness in innovativeness, among others. Beyond these reasons, in the case of PPPs, the private sector is increasingly getting more involved in the provision of public infrastructure and services across a wide range of industries and sectors, including power, transportation, water supply and disposal,

telecommunications, oil and gas, mining, schools, hospitals, and military training facilities in order to alleviate the spending on governments' budgets (Algarni, Arditi & Polat, 2007; Zhang, 2005; Chege & Rwelamila, 2001). Dada, Oyediran and Okikiolu (2006) acknowledged that different models or variants of the PPP exist, but the underlying principle of a synergy of efforts or resources between the public and private sectors remain apparent. Li and Akintoye (2003) acknowledged that partnerships come in all sizes and types. Li et al. (2003) also reported that the most important PPPs since the 1990s have been in the sectors of education, health and transportation. This is thus a paradigm shift, which has general underlying philosophy of co-operation between the public and private sectors in the provision of services and other infrastructure projects. Government is no longer considered the sole provider of public works and services. PPPs through such model as the private finance initiative have been recognised as important approaches to solving problems for governments in providing infrastructure systems (Ho, 2006). Some of the forces driving this movement have been a scarcity of public resources, a political trend toward the deregulation of infrastructure, and an expansion of global markets (Ababutain, 2002). . In essence, PPP approach can have a strong positive effect on the economic life of any country (Montanheiro, 2008).

As at 2006, PPP was at its infancy in Nigeria (Dada *et al*, 2006), four years later there has been an increasing penetration of PPP into many sectors of Nigeria's economy. The Nigerian Federal Government has established an Infrastructure Concession and Regulatory Commission to drive the provision of infrastructure through the use of PPP. Governments at other levels (state and local) are also increasingly advocating for and utilising the PPP methodology. For instance, in Lagos state, the PPP methodology has been adopted in the generation of power, management of waste, highway maintenance, and street cleaning and provision of infrastructure, among others. As a matter of fact, Ibem (2009) reported the emerging scenario of some government agencies in Nigeria collaborating with the private sector in the provision of mass housing for citizens as against the earlier approach where government approached such mass housing strategy without the involvement of the private sector.

This research thus intends to assess and rank success sub factors (SSFs) under some identified critical success factors (CSFs) in the implementation of PPP construction projects in Nigeria. In the process, the research further seeks to investigate the perceptions of the public sector and private sector stakeholders on those SSFs and to further ascertain whether there are significant differences in rankings of those success sub-factors between the public and private sectors. The logic of using the public and private sectors is that the two sectors are key stakeholders in PPP projects. Stakeholder management is important in project execution (Yuan, Skibniewski, Li & Zeng, 2010). This is implied from Dada (2007) and the Guardian (2002), who reported that the failure of many government or intervention projects in times past stemmed out partly from the failure of government to carry along stakeholders and the host communities in the execution of such projects. As a matter of fact, El-Gohary, Osman and El-Diraby (2006) claimed that stakeholder opposition has been reported as being responsible, in several instances, for the failure of PPP initiatives. Nigeria still has a lot of housing and other critical infrastructure to provide for her citizens according to Ogunlana (2010) and as such, has to explore several options to achieve this vision. It is necessary to understand perceptions of stakeholders on intervention and development projects. This is because perceptions, though subjective, have a way of affecting and influencing reality, customer behaviour and responses (Weaver, 1981; Smith & Nagle, 1995, Smyth & Edkins, 2007). The acceptance or otherwise of any intervention programs in the procurement of public infrastructure may therefore be circumscribed in perceptions held by stakeholders on such programs. This study thus has the capability of contributing to the PPP body of knowledge. Its outcome could be of relevance to the international research and investment community (especially in this age of globalisation and international trade), the Nigerian public and private sectors and multilateral organisations. Additionally, this knowledge could help in the development of an efficient knowledge-based procurement framework for PPP best practices in Nigeria. Lessons can also be learned by other nations in the developing world.

2   CRITICAL SUCCESS FACTORS AND SUCCESS SUB-FACTORS FOR PPP PROJECTS

Critical success factors are related to good outcomes for an organisation that will help organisational survival and performance. On the project level they are factors that enhance project performance. The concept of critical success factors (CSFs) was first developed by Rockart (1979), as reported in Jefferies, Gameson and Rowlinson (2002). CSFs are those areas 'in which, results if they are satisfactory, will ensure competitive performance for the organisation'. Yang, Shen, Ho, Drew and Chan (2009) while quoting Seraph *et al* (1989) view CSFs as 'those critical areas of managerial planning and action that must be practised in order to achieve effectiveness'. According to Russell (2008), an understanding of CSFs may assist business executives in improving their processes so as to reduce the cost of project failure. The concept of the CSFs cuts across different fields of human endeavour (Omran, Omran & Kadir, 2010; Ansarinejad, Amalnick, Ghadamyan & Hatami-Shirkonchi, 2011) where process improvement is desired. According to Zhang (2005), the identification of CSFs will help in the efficient allocation of limited resources. Additionally, Jefferies *et al.* (2002) reported that Rockart and the Sloan School of Management developed the concept of CSFs. They also reported that Morledge and Owen (1999) had developed the concept of CSFs to identify certain weaknesses associated with the practical application of Rockart's method. These include: subjectivity; bias, human inability to process complex information, change in relation to surrounding environments; imprecise definitions and generalisations, and qualitative performance measures. This method of CSFs has been applied as a management measure in a number of sectors. Thus, there have been attempts to apply this same concept to construction management.

The procurement of infrastructure project especially in the construction sector can be done through many routes. Such routes include the traditional method, the integrated methods, management oriented methods and collaborative methods (). These methods are however more of construction industry options. While it is true that PPPs have the underlying philosophy of integration of design and construction in the context of the construction industry, the pervasive and octopoidal effect of the PPP across many sectors and even in the provision of services differentiates it from other procurement paths in the construction industry.

A number of authors have identified CSFs for PPP projects. In a study limited to China, Chan, Lam, Chan, Cheung, and Ke (2010) used 18 factors to investigate opinions on CSFs in PPP. The factors were decomposed into five underlying groups or factors: stable macroeconomic environment, shared responsibility between private and public sector, transparent and efficient procurement process, stable political and social environment, and judicious government control.

In a work on PPP in the United Arab Emirates, Dulaimi, Alhashemi, Ling and Kumaraswamy (2010) concluded that political support was regarded as most critical factor, while lack of appropriate knowledge and skills of the consortia leads to project failure. Cheung and Chan (2011) studied negative and attractive factors for PPP projects in a Hong Kong survey, developed a model and tested it on a project in Hong Kong Zuhai Macau Bridge. In that project, negative factors outweighed positive by 27%.

Tiong (1996) identified six CSFs for private contractors in competitive tendering and negotiation in BOT contracts as: entrepreneurship and leadership; right project identification; strength of the consortium; technical solution advantage; financial package differentiation; and differentiation in guarantees. Jefferies et al. (2002) explored CSFs for BOOT procurement system specific to Stadium Australia. Hardcastle, Edwards, Akintoye and Li (2005) used factor analysis approach to identify CSFs in PPP/PFI projects in the United Kingdom construction industry: effective procurement; project implementability; government guarantee; favourable economic conditions; and available financial market.

The work of Zhang (2005) suggests that PPPs involve various kinds of risks that may emerge at different stages in the life cycle of a project. He argued that PPPs should be seen as merely a vehicle for governments to develop infrastructure projects by transferring all the risks to the private sector and

thus shedding of all their responsibilities. The risks require appropriate allocation and management. He further reiterated that private finance initiatives do not automatically lead to successful infrastructure projects. He then advocated that PPP project procurement should be based on a public–private win–win principle. It is under this premise that he was able to identify five CSFs and a number of SSFs. These are: favourable investment environment; economic viability; reliable concessionaire with technical strength; sound financial package; and appropriate risk allocation via reliable contractual arrangements.

Furthermore, the work of Zhang (2005) cut across continental boundaries in scope of study and data collection. He anticipated an improved strategy for the implementation of 'future' PPP projects. In the process, he explored literature and examined some cases. He also sought opinions from international experts and was thus able to identify, analyse and categorise a list of CSFs. The identified CSFs were: economic viability, appropriate risk allocation via reliable contractual arrangements, sound financial package, reliable concessionaire consortium, and favourable investment environment. Under each CSF were sub-factors that evolved in the research process. Each of the CSFs has at least five success sub-factors SSFs under it. The SSFs under economic viability were: long-term demand for the products/services offered by the project, long-term cash flow that is attractive to lender, sufficient profitability of the project to attract investors, long-term availability of suppliers needed for the normal operation of the project, limited competition from other projects. For appropriate risk allocation via reliable contractual arrangements, the success sub-factors were: appropriate and reliable risk allocation in: concession agreement Off take agreement, guarantees/support/comfort letters, loan agreement, shareholder agreement, operation agreement, insurance agreement, design and construct contract, and in supply agreement. For sound financial package the SSFs were: appropriate toll/tariff level(s) and suitable adjustment formula, abilities to deal with fluctuations in interest/exchange rates, sound financial analysis, investment, payment, and drawdown schedules, sources and structure of main loans and standby facilities, long - term debt financing that minimises refinancing risk, stable currencies of securitisation (debts and equity finance), fixed and low interest rate financing, low financial charges, and

high equity/debt ratio. For reliable concessionaire consortium with adequate technical strength the SSFs were: good relationship with host government authorities, strong and capable project team, leading role by a key enterprise or entrepreneur, effective project organisation structure, sound technical solution, cost-effective technical solution, low environmental impact, public safety and health considerations, multidisciplinary participants, partnering skills, innovative technical solution, and rich experience in international PPP project management. Under favourable investment environment, the SSFs were: stable political system, favourable economic system, government support, the project is in public interest, predictable risk scenarios, the project is well suited for privatisation, adequate local financial market, predictable and reasonable legal framework, supportive and understanding community, predictable currency exchange risk, and promising economy.

Incidentally, a number of researchers, in one way or the other, have made use of Zhang (2005) model in the context of advancing PPP infrastructure projects. Among these researchers are Wen-xiong et al. (2007), Aziz (2007), Kwak et al. (2009), Chan et al. (2010), and Tang et al. (2010). While developing a framework for CSFs for PPP infrastructure projects in China, Wen-xiong et al. (2007) and Chan et al. (2010) combined Zhang's (2005) with other model from literature in creating their frameworks based on the need for CSF for PPP projects in the region. Likewise in the work of Kwak et al. (2009), the model of Zhang (2005) played a central role in their conceptual classification of the PPP research framework in order to have a broad understanding of PPP infrastructure projects due to the fact that Zhang's (2005) model has international coverage. Additionally, Aziz (2007) used part of Zhang's (2005) model while trying to formulate guidelines for successful implementation of PPP infrastructure projects in the United States. Tang et al. (2010) reviewed procurement route for infrastructure development in the construction industry. Interestingly, Zhang's (2005) model is at the forefront in the review.

There is an ongoing concern to assess PPP projects on the basis of some success factors. This is because the goal of CSFs is to improve ultimately organisational or process performance. CSFs according to Yu et al. (2006) can be used as a template and checklist for future projects. It is in this

context that this study seeks to assess PPP projects in Nigeria on the basis of some success sub-factors. For an assessment of SSFs on PPP projects in Nigeria, this research aligns with and uses the instrument developed by Zhang (2005). This decision is underscored by the fact that Zhang (2005) obtained the CSFs/SSFs for PPP projects while consulting with international experts in addition to using the developed instrument across continental boundaries. The current researchers also reasoned that the fact that Zhang (2005) used the instrument across international boundaries would not invalidate the instrument if used in Nigeria; rather it would imply a focus on Nigeria. This current research thus presumes the comprehensiveness of the CSFs and SSFs developed by Zhang (2005).

3   RESEARCH METHODOLOGY

A literature review was conducted for the research. A number of CSFs and SSFs were identified. Chua *et al.* (1999) posited that CSFs can be identified through the use of expert opinions. They also further acknowledged that one method of eliciting the expert opinions is to present a predetermined list of factors to the experts who would then assess on a predetermined scale. Consequently, the authors of the current research paper made use of the factors identified by Zhang (2005) based on the comprehensiveness of the factors to elicit responses. A questionnaire survey was then developed and used as a research tool to get data on these main factors. The sub-factors for each critical success factor were also indicated and assessed separately in the instrument. The respondents were required to indicate their perception of the significance of those sub-factors. The population for the research was senior/middle-level managers, and project managers/officers in public ministries, banking institutions, law firms, construction companies, consulting firms, academia, and investment companies that were directly responsible for managing and administering construction related PPP projects. The respondents were based in Lagos, the commercial nerve-centre of Nigeria, where there were ongoing PPP projects or where the offices of stakeholders in PPP projects were located. The respondents' sample was obtained with the use of non–probability sampling technique. This technique is justifiable as there was no known or published database of users of, or stakeholders in the PPP procurement method in the study area then. The techniques involved mainly the snowballing and convenience sampling techniques. (In this respect, the authors acknowledge the possible effect of the use of non-probabilistic sampling on results generalisation. The research is none the less a launching pad and also a response to the reality in the research environment). Respondents were asked to rate the criticality of CSFs on a scale of $0 - 5$ (with '0' being 'not applicable', '1' being 'not critical', '2' being 'fairly critical', '3' being 'critical', '4' being 'very critical', and '5' being 'extremely critical'. Furthermore, they were asked to rate the relative significance of the success sub factors on a scale of $0 - 5$ (with '0' being 'not applicable', '1' being 'not significant', '2' being 'fairly significant', '3' being 'significant', '4' being 'very significant', and '5' being 'extremely significant'. The content validity of the questionnaire was based on the literature review as proposed by several experts. Therefore, it is asserted that the items included in the questionnaire had content validity. To ensure the reliability of each item included in the questionnaire, Cronbach's coefficient - alpha (α) - was used to test the internal consistency. As a reliability coefficient, α varies from 0 to 1; the higher the reliability coefficient, the greater the internal consistency or reliability (Zhang, 2005). George and Malery (2000) provided the rule of thumb that applies to most situations since there is no set interpretation as to what an acceptable a level is.

$$\alpha > \begin{cases} 0.9 & \text{Excellent} \\ 0.8 & \text{Good} \\ 0.7 & \text{Acceptable} \\ 0.6 & \text{Questionable} \\ 0.5 & \text{Poor} \end{cases}$$
$$\alpha < 0.5 \text{ Unacceptable}$$

The values of Cronbach's α for different CSFs and SSFs ranged from 0.8328 to 0.9654. These values were judged acceptable, making all the factors reliable. 120 questionnaires were administered. Of this number, fifty-nine (59) respondents returned complete questionnaires. The effective return rate was 49%. This is higher than 12% reported by Hardcastle *et al* (2005).

4 RESULTS AND ANALYSIS

The 'significance index' of each of SSFs was calculated based on the formula provided by Zhang (2005).

Significance index $= (0R_{i0} + 20R_{i1} + 40R_{i2} + 60R_{i3} + 80R_{i4} + 100R_{i5})/ (R_{i0} + R_{i1} + R_{i3} + R_{i4} + R_{i5})$

Where R_{i0} = number of responses as '0' for the ith factor or sub factor;
R_{i1} = number of responses as '1' for the ith factor or sub factor;
R_{i2} = number of responses as '2' for the ith factor or sub factor;
R_{i3} = number of responses as '3' for the ith factor or sub factor;
R_{i4} = number of responses as '4' for the ith factor or sub factor;
R_{i5} = number of responses as '5' for the ith factor or sub factor.

4.1 Descriptive statistical analysis

Table 1 shows the sector classification of the respondents.

Table 1: Sector classification of the respondents

Organisation Type	Frequency	Percentage
Public	25	42.4
Private	34	57.6
Total	59	100

Thirty-four (34) respondents representing 57.6% come from the private sector while the remaining 25 respondents (42.4%) come from the public sector.

Table 2 shows the working background of the respondents.

Table 2: Employment background of the respondents

Working Background	Frequency	Percentage
Academic	13	22.0
Industry	46	78.0
Total	59	100

Forty-six (46) respondents representing 78.0% are working in the industry while the remaining 13 respondents (22.0%) are from academics.

Table 3 shows the academic qualification of the respondents

Table 3: Academic qualifications of respondents

Academic Qualifications	Frequency	Percentage
Diploma	4	6.8
Bachelor's degree	21	35.6
Master's degree	30	50.8
PhD	4	6.8
Total	59	100

Table 3 shows the academic qualifications of the respondents. 50.8% indicated that master's degree is the highest level of education they possess. 35.6% holds bachelor's degree while 6.8% holds PhD degree. The remaining 6.8% has diploma as the highest level of education. This shows that about 58% of the respondents hold higher degrees above bachelor's degree.

Table 4 reveals the years of working experience of the respondents in the construction industry.

Table 4: Years of work experience in the construction industry

Years	Frequency	Percentage
1 – 5	0	0
6 – 10	0	0
11 – 15	11	18.6
16 – 20	23	39.0
21 & above	25	42.4
Total	59	100

Above 80% of respondents have more than 15 years of working experience in the construction industry. This suggests that majority of the respondents has the required experience to answer the questionnaire.

Table 5 shows the years of working experience of the respondents in the PFI/PPP related projects.

Table 5: Years of working experience in PFI/PPP related projects

Years	Frequency	Percentage
1 – 5	27	45.8
6 – 10	27	45.8
11 – 15	5	8.5
Above 16	0	0
Total	59	100

45.8% of the respondents indicated that they have between 1 and 5 years working experience in the PFI/PPP related projects. The same quantum of respondents (45.8%) indicated that they have between 6-10 years working experience in the PFI/PPP related projects. The remaining 8.5% indicated that they have between 11-15 years working experience in the PFI/PPP related projects. This shows that majority of the respondents have less than 10 years working experience in the PPP related projects. This is due to the fact that PPP procurement system is still at an infant stage in Nigeria and the majority of the 'so-called' experts in the field in Nigeria do not have more than 10 years of working experience.

Table 6 shows a summary of the significance indices from the public sector, and the private sector on 'SSFs'. These sub-factors were separately itemised in the instruments for respondent to complete. The aggregated values for the sectors are also shown in the same table. The table serves the purpose of illuminating the ranking of each sub-factor based on the extrapolated or calculated significance indices. The table further shows the spearman rank correlation coefficient for sub-factors under each CSF.

For all the responses under favourable investment environment, the first five SSFs on basis of ranking are stable political system (95.0%), favourable economic system (90.8%), government support (84.4%); the project is well suited for privatisation (82.4%), and predictable risk scenarios (81.6%). Under the economic viability, long-term demand for the products/services offered by the project (89.2%) ranked highest. Others are: sufficient profitability of the project to attract investors (86.8%), long-term cash flow that is attractive to lender (86.8%), long-term availability of suppliers needed for the normal operation of the project (72.8%), and limited competition from other projects (65.8%). In reliable concessionaire consortium with adequate technical strength, the first five most ranked SSFs are: good relationship with host government authorities (86.2%), leading role by a key enterprise or entrepreneur (84.8%), strong and capable project team (86.2%), effective project organisation structure (80.0%), and sound technical solution (77.2%). For sound financial package, the five most ranked SSFs are: appropriate toll/tariff level and suitable adjustment formula (89.4%), abilities to deal with fluctuations in interest/exchange rates (86.2%), sound financial analysis (83.4%), sources and structure of main loans and standby facilities (81.6%), and investment, payment and drawdown schedules (80.0%). Under the appropriate risk allocation via reliable contractual arrangements, the following are the five most ranked SSFs: concession agreement (83.8%), loan agreement (79.4%), guarantees/support/comfort letters (80.0%), operation agreement (76.6%), and off take agreement (75.6%). It will be noted that the lowest percentage significance in all is 60.4%. This suggests that all the SSFs are regarded as significant and therefore very important to the success of PPP projects.

Table 6: Significance indices and ranks of success sub-factors	Public		Private		Overall		CC
Success sub factors	S.I.	R.	S.I.	R.	S.I.	R.	
Favourable investment environment							
Stable political system	93.6	1	95.8	1	95	1	
Favourable economic system	92.8	2	89.4	2	90.8	2	
Government support	90.4	3	80.0	4	84.4	3	
The project is in public interest	85.6	4	75.8	6	82.4	4	r_s =0.92
Predictable risk scenarios	84.8	5	79.4	5	81.6	5	
The project is well suited for privatisation	82.4	6	82.4	3	80	6	
Adequate local financial market	80.8	7	68.2	8	76	7	
Predictable and reasonable legal framework	80.0	8	73.0	7	73.6	8	
Supportive and understanding community	74.4	9	63.0	10	68.4	9	
Predictable currency exchange risk	71.2	10	66.4	9	67.8	10	
Promising economy	61.6	11	61.2	11	61.4	11	
Economic viability							
Long-term demand for the products/services offered by the project	88.8	1	89.4	1	89.2	1	
Long-term cash flow that is attractive to lender	87.2	2	86.4	3	86.8	2	r_s =0.90
Sufficient profitability of the project to attract investors	85.6	3	87.6	2	86.8	2	
Long-term availability of suppliers needed for the normal operation of the project	68.8	4	75.8	4	72.8	4	
Limited competition from other projects	60.0	5	70.0	5	65.8	5	
Reliable concessionaire consortium with adequate technical strength							
Good relationship with host government authorities	90.4	1	83.0	2	86.2	1	
Strong and capable project team	87.2	3	85.2	1	86.2	1	
Leading role by a key enterprise or entrepreneur	88.8	2	81.8	3	84.8	3	r_s =0.92
Effective project organisation structure	80.8	5	79.4	4	80	4	
Sound technical solution	81.6	4	74.2	7	77.2	5	
Cost - effective technical solution	78.4	6	75.8	5	77	6	
Low environmental impact	77.6	7	75.2	6	76.2	7	

	S.I.	R	S.I.	R	S.I.	R	CC
Public safety and health considerations	66.4	9	73.0	8	71.6	8	
Multidisciplinary participants	70.4	8	72.4	9	70.2	9	
Partnering skills	63.2	11	70.6	11	70.2	9	
Innovative technical solution	67.2	10	72.4	9	67.4	11	
Rich experience in international PPP project management	58.4	12	61.8	12	60.4	12	
Sound financial package							
Appropriate toll/tariff level(s) and suitable adjustment formula	93.6	1	86.4	1	89.4	1	
Abilities to deal with fluctuations in interest/exchange rates	88.0	2	84.8	2	84.8	2	$r_s = 0.95$
Sound financial analysis	82.4	3	84.2	4	83.4	3	
Investment, payment, and drawdown schedules	80.8	4	79.4	5	81.6	4	
Sources and structure of main loans and standby facilities	77.6	5	84.8	2	80.0	5	
Long - term debt financing that minimises refinancing risk	76.8	6	78.2	6	77.6	6	
Stable currencies of securitisation (debts and equity finance)	73.6	7	75.8	7	75.0	7	
Fixed and low interest rate financing	70.4	8	73.6	8	72.2	8	
Low financial charges	61.6	9	71.2	9	67.2	9	
High equity/debt ratio	58.4	10	71.2	9	65.8	10	
Appropriate risk allocation via reliable contractual arrangements							
Appropriate and reliable risk allocation in:							
Concession agreement	86.4	1	81.8	1	83.8	1	
Off take agreement	78.4	3	73.6	7	80	2	
Guarantees/support/comfort letters	81.6	2	78.8	3	79.4	3	
Loan agreement	77.6	4	80.6	2	76.6	4	$r_s = 0.75$
Shareholder agreement	76.0	5	74.8	5	75.6	5	
Operation agreement	74.4	7	78.2	4	75.2	6	
Insurance agreement	75.2	6	74.8	5	75.0	7	
Design and construct contract	70.4	8	63.0	8	66.2	8	
Supply agreement	65.6	9	59.4	9	62.0	9	

Note: S.I. = Significance Index; R = Ranking ; CC (also represented by r_s) =Spearman rank correlation coefficient between the public and private sector ranks of success sub-factors

4.2   Inferential statistical analysis

Thus far the success sub-factors have been grouped and ranked according to sectors (public and private). For the success sub-factors the correlation coefficients have been calculated and are indicated in Table 6 above. Even though the correlation coefficients are reasonably high (using a scale of '0' to '1' for positive correlation or '0' to '-1' for negative correlation), it is still necessary to test whether those coefficients are statistically significant. In an attempt to subject the correlation of the ranks of the sub-group to further statistical tests, the following null and alternative hypotheses were formulated and tested:

Null Hypothesis (H_0): There is no significant difference in the ranking of the public and
private sectors on the success sub-factors for PPP projects

Alternative Hypothesis (H_1): There is significant difference in the ranking of the public
and private sectors on the success sub-factors for PPP projects

These hypotheses were set up to test if there is any agreement on the ranking of the of the significance indices of the success sub-factors as perceived by public and private sectors. The null hypothesis and alternative hypothesis apply to each group of success sub-factors, (there are five sub-groups as shown in Table 6), and were tested accordingly. For convenience, a summary of the test of agreement result for success factors under each critical success factors is presented in Table 7. Table 7 thus shows the result of the computation of Spearman's rank correlation coefficient, the test of agreement of the rankings between the public and private sectors the t-values, and the decision on the null hypothesis for the significance indices of the success sub factors. The level of significance for this test was set at 5%.

Table 7: Statistical significance tests of differences in rankings between the private and public sectors

Sub-sector head	rs	DF	t-al	t-ab		Decision
(a) Economic viability	0.92	9	7.04	2.26	0	accept Hi
(b) Favourable investment environment	0.9	3	3.58	3.18	0.02	accept Hi
© Reliable concessionaire consortium with adequate strength	0.92	10	7.42	2.23	0	accept Hi
(d) Sound financial package	0.95	8	8.61	2.31	0	accept Hi
(e) Appropriate risk allocation via appropriate contractual arrangements	0.75	7	3	2.37	0.02	accept Hi

rs =Spearman rank correlation coefficient; t-cal = t-calculated; t-tab = t-tabulated
DF = degree of freedom

From Table 7, using the appropriate degrees of freedom, it can be observed that for all the success sub-factors the *t*-calculated values (*t*-cal=7.04, 3.58, 7.42, 8.61, and 3.00) are greater than *t*-table values (*t*-tab=2.26, 3.18, 2.23, 2.31, and 2.37) respectively. This implies rejecting the null hypothesis and accepting the alternative hypothesis for the test for agreement in rankings of the success sub-factors between the private and public sector under each grouping of sub-factors. It is then safe to say that there is significant difference between the public and private sectors on their perception regarding success sub-factors. It can then be interpreted that there is no agreement between the public and private sectors on their perception regarding the significance indices of the success sub factors.

5   DISCUSSION

Both the descriptive and inferential statistical analyses throw up some issues. Specifically, under favourable investment environment, both the private and public sectors ranked 'stable political environment' as the most important factor for the success of PPP projects. The ranking of stable political environment as the most important in this research agrees with the finding of Dulaimi *et al.* (2010) and Alhashemi *et al.* (2008) in studies of

success factors on PPP projects in the United Arabs Emirates. Furthermore, in this research, both sectors ranked promising environment least. This may imply that PPP stakeholders are not moved by potentials of a country rather by existing favourable environment. Under economic viability both sectors rank long-term demand for the products/services offered by the project as the most important while limited competition from other projects was ranked least by both sectors. With respect to factors under reliable concessionaire consortium with adequate technical strength, the public sector ranked 'good relationship with host government authorities' most important while to the private sector 'strong and capable project team' is the most important success factor or criterion. Under the 'CSF' of sound financial package, 'appropriate toll/tariff level(s) and suitable adjustment formula' is regarded as the most significant success factor by the two groups. The private sector ranked low financial charges and high equity/debt ratio least concurrently while the public sector ranked high equity/debt ratio least. For the 'CSF' of 'appropriate risk allocation via reliable contractual arrangements' the most significant success factor for the two sectors is 'appropriate and reliable risk allocation in concession agreement'. The least important to the two sectors was 'appropriate and reliable risk allocation in supply agreement'.

This result of the inferential statistical analysis is further illuminating and can be explained by the fact that the private and public sectors from commercial perspectives are two different entities. Both sectors have their own definition of what is success on PPP projects. The research work, though not essentially identical to that of Richett and Bachmann (2006), has some similarities. In their work on PPPs in Germany, Richett and Bachmann (2006) identified some issues that are judged critical to PPP implementation. They concluded however that different parties to PPP procurement processes have different opinions on the degree of uniform standards and framework for conditions for PPP projects. Their research did not show any analytical and statistical evidence for its conclusion. This research on Nigeria has identified the perceptions of the critical stakeholders in PPP. The differences in perceptions on PPP success sub-factors can be related to a research on priorities for implementation of public sector projects in Dada (2007). The current research and Dada (2007) both focus on projects involving the public

sector. However Dada (2007) suggests that there are no significant differences in the expectations or priorities of consultants and contractors in public sector project implementation. The results of the two works may be explained by the fact that the assessing parties are different. The works of Dada (2007) show that the assessing parties, even though they were two in the research, were all in the private sector. The assessing parties were consultants and contractors who were both located in the private sector. In this current research, however an assessment by both private sector and public sector participants on the PPPs projects is made. In essence, while the success sub-factors and priorities may be judged to be circumscribing similar issues, the differences in results can be explained by differences in the assessing parties.

A major implication of the findings of the research is the perception gap between the private sector and public sector on the 'CSFs'. This perception gap has the potential of influencing or affecting the acceptability and performance of PPP projects in the country. Perhaps a recent publication can further illuminate or corroborate this finding or its implication. Fakoya (2010) reported that there were protests and demonstrations on the tolling of the Lekki-Epe Expressway in Lagos that was being executed with the PPP, when the contractor put three tollgates on the road and put up levies for vehicular users. While the government reportedly did not see anything wrong in tolling, the users complained of the cost implication and felt that the road which was yet to be 100% completed could have been constructed without PPP by using their taxes, and thus eliminating tolls. Fakoya (2010) wrote further on the issue and said ''the people's complaints centred among others on lack of communication and engagement on the part of government… Merely appealing to the people to accept an intolerable idea as being done …is just not the solution'' (The Punch, 2010, p.12). To resolve issues the Lagos State Government eventually set up a committee to trash out issues that led to the protest. While this research does not take sides with any parties and does not consider the propriety or otherwise of any action of the parties, the issue has only brought to the fore the finding of this research or the implication of the effect of perception gap on 'CSFs' on PPP projects. In the light of these findings and their implications, it is recommended that relevant stakeholders take measures to close this

perception gap while formulating and/or implementing policies for PPP projects in Nigeria. The same recommendation can be extended to any other nation engaged in the use of PPP for public projects and services. The generalizability of this research finding with the attendant recommendations can however be limited by the methodological approaches of sampling used. The methodology thus moderates the finding and general applicability.

6   CONCLUSIONS AND RECOMMENDATIONS

This study sought to assess SSFs for the use of the PPPs in Nigeria. The study has established for the Nigerian environment, in the order of importance, SSFs adopted from an earlier international study. Under favourable investment environment both the private and public sectors ranked stable political environment as the most important factor for the success of PPP projects. Long-term demand for the products/services offered by the project as the most important was regarded as the most important sub-factor under economic viability. On factors relating to reliable concessionaire consortium with adequate technical strength, the public sector assessed good relationship with host government authorities as the most important while to the private sector perceived strong and capable project team as the most important success factor or criterion. For sub factors under the critical success factor of sound financial package, appropriate toll/tariff level(s) and suitable adjustment formula are regarded as the most significant success factor by both sectors. To the private sector, low financial charges and high equity/debt ratio were ranked least concurrently while the public sector ranked high equity/debt ratio least. For the critical success factor of appropriate risk allocation via reliable contractual arrangements the most significant success sub factor for the two sectors was appropriate and reliable risk allocation in concession agreement. Furthermore, the findings of this study suggest that there is no agreement in the perceptions of both the public and private sectors on the criticality of success factors and significance of SSFs based on hypothesis tested. The lack of homogeneity in perceptions between the public and private sectors on PPP projects suggests a gap in perceptions between the two sectors. It is recommended that relevant stakeholders can be appropriately guided in

policy formulation for PPP projects in Nigeria. This perception gap has to be appropriately managed for consensus building to carry along relevant stakeholders. A study of this nature can be replicated in other developing countries.

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