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Factors influencing professionalism and the viability of local firms in Nigeria

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Abstract

It is imperative to know the place of professionalism in the viability of local construction firms (LCFs) in developing countries. This article identified and examined various factors related to professionalism from diverse aspects that influence firms' viability in the construction industry. From a literature review, 37 variables influencing the viability of local construction firms were identified of which 19 relate to professionalism. 177 staff from LCFs who were awarded building contracts in selected institutions in Nigeria were requested to rate the importance of each viability factor on a 5-point Likert scale. Mean score ratings and principal component analysis were used to identify and summarise the most important factors. Three of the four "extremely important" factors are directly related to professionalism in the construction industry: organisational competence, quality of work and services, and quality of construction work and services, with mean scores of 4.4, 4.31, and 4.30, respectively. Out of the 11 component factors obtained, three topmost factors are directly related to professionalism in the construction industry. These factors were labelled: "construction

resources" (9.27%); "improved construction method" (3.24%), and "quality service and satisfaction" (2.84%). These factors substantiate the importance of professionalism in the viability of LCFs and should motivate various professionals in the construction industry to demonstrate their effectiveness in good service delivery and ethics.

Keywords: Construction industry, local construction firms, professionalism, viability, Nigeria

Abstrak

Dit is noodsaaklik om die plek van professionaliteit in die lewensvatbaarheid van plaaslike konstruksie maatskappye in ontwikkelende lande te weet. Hierdie artikel het verskillende faktore wat met professionaliteit verband hou, geïdentifiseer en ondersoek uit die verskillende faktore wat ondernemings se lewensvatbaarheid in die konstruksiebedryf beïnvloed. Uit 'n literatuurstudie is 37 veranderlikes geïdentifiseer wat die lewensvatbaarheid van plaaslike konstruksie maatskappye beïnvloed, waarvan 19 betrekking het op professionaliteit. 177 personeellede van plaaslike konstruksie firmas wat boukontrakte by geselekteerde instellings in Nigerië ontvang het, is versoek om die belangrikheid van elke lewensvatbaarheidsfaktor op 'n Likert-skaal van 5 punte te beoordeel. Gemiddelde tellingwaardes en hoofkomponentanalise is gebruik om die belangrikste faktore te identifiseer en op te som. Drie van die vier "uiters belangrike" faktore hou direk verband met professionaliteit in die konstruksiebedryf: organisasiebevoegdheid, kwaliteit van werk en dienste, en kwaliteit van konstruksiewerk en dienste, met 'n gemiddelde punt van onderskeidelik 4.4, 4.31, en 4.30. Uit die 11 faktore wat verkry is, is drie faktore direk verwant aan professionaliteit in die konstruksiebedryf. Die faktore is gemerk: "konstruksie hulpbronne" (9.27%); "Verbeterde konstruksiemetode" (3.24%), en "Kwaliteit diens en tevredenheid" (2.84%). Hierdie faktore bevestig die belangrikheid van professionaliteit in die lewensvatbaarheid van LCF's en behoort verskillende professionele persone in die konstruksiebedryf te motiveer om hul doeltreffendheid in goeie dienslewering en etiek te demonstreer.

Sleutelwoorde: Boubedryf, lewensvatbaarheid, Nigerië, plaaslike konstruksie maatskappye, professionaliteit

1. Introduction

The Nigerian construction industry employs approximately 20% of Nigeria's workforce (National Bureau of Statistics, 2006), making it perhaps the largest employer of construction labour in Africa. The industry accounts for roughly 69% of the nation's fixed capital formation, of which 70% of the net capital investment in Nigeria is for the construction industry (Business Monitor International, 2007). The National Bureau of Statistics (2014) reported that the Nigerian construction industry recorded an average of 3.4% contribution to the GDP from 2010 to 2013. This contribution, though small, has both a direct and an indirect impact on the national economy, as it stimulates the growth of other sectors through a complex system of linkages (Lewis, 2004: 541-545; Alabi, 2010: 605-613).

Construction firms can be broadly categorised into foreign and local construction firms (LCFs). LCFs constitute 95% of the total number of construction firms, while the remaining 5% are foreign in origin (Idoro, 2004: 817-826; Oladapo, 2007: 261-177; Ibrahim, Githae & Stephen, 2014: 1-15). Aniekwu (1995: 445-455) observed that, out of the 334 construction contractors surveyed in Nigeria, 266 (79.69%) were LCFs. Many LCFs in Nigeria and other developing countries have ceased operation, while others are operating at a very low capacity, thus placing a question mark on their viability (Fagbenle, 2000; Olatunji, Ajibola & Coker, 2000; Enshassi, Mohamed & Abushaban, 2009: 269-280; Oladapo, 2007: 261-267; Bala, Bello, Kolo & Bustani, 2009: 251-259; Idoro, 2004; Alabi, 2010). This may be due to various construction challenges and inadequacies coupled with the harsh construction business environment.

For example, Oke and Falemu (2009: 873-884) noted that most of the private residential buildings that had collapsed were constructed by LCFs. Olugboyega (1995), Oladapo (2007), and Idoro (2010) all observed that foreign and indigenised contractors dominate the Nigerian construction industry's volume of work capacity, due to the LCFs' incompetence in handling complex projects.

In nations where LCFs have witnessed tremendous progress, there have been studies that involved deliberate identification, measurement, and administration of various construction business performance measures (Chan, Tam & Cheung, 2005: 111-124; Huang 2009: 581-596; Halim, Jaafar, Osman & Akbar, 2010: 28-39). Traditionally, there is more emphasis on construction business performance based on financial criteria, and their main advantage is that they are easily captured and provide a quantitative output. Financial factors are vital to the viability of the construction business, but they need to be supported by non-financial factors, in order to achieve a holistic performance (Mbugua, Harris, Holt & Olomolaiye, 1999; Sonson, Kulantuga & Pathirage, 2017: 516-528). One of these non-financial factors is professionalism, and the characteristics of construction activity and the construction products require that all professionals engaged in the construction process should demonstrate true professionalism. One of the ways to assess this is to identify its place in factors determining the success of construction projects and firms, in general.

This article identifies and examines the importance of various factors influencing a firm's viability in the construction industry, in order to analyse the crucial place of professionalism in the viability of LCFs. The article demonstrates the need for professionalism in the construction

industry, bearing in mind the characteristics of construction activity and the products that require professionalism on the part of all participants in the construction process (Construction Leadership Council, 2013; Farmer, 2016; World Economic Forum and Boston Consulting Group, 2016).

2. Literature review

2.1 Local construction firms

LCFs can be classified into small, medium and large firms, according to their level of capitalisation and annual turnover. Local firms contribute to social and economic development in terms of job formation – entrepreneurship; wealth dispersal; financial effectiveness in deployment of resources; elasticity to market demands; distribution of development; economic and political independence, and innovation (Olugboyega, 1998). They dominate the small medium-scale construction enterprises that are mostly involved in the construction of private residential offices and commercial buildings that is germane to the grassroot economic development of the populace (Olugboyega, 1998; Opoko, 2004: 13-17; Oladimeji & Aina, 2018: 116). LCFs are very relevant as contractors for maintenance work and as subcontractors for construction labour and specialized work items (Ng & Price, 2002: 811-819; Laryea, 2010: 541-545).

Despite the potential of LCFs, relevant literature on the construction industry has numerous accounts of LCFs' failures, due to various construction challenges and inadequacies, coupled with the harsh construction business environment (Laryea, 2010: 541-545; Ofori, 2010; Oladimeji & Aina, 2018: 112-128).

2.2 Factors influencing the viability of construction firms

Various studies have focused on factors influencing the viability of construction firms, including construction business financial management; management of construction operations; construction business companies and market environment evaluation studies; construction business technical competence, and construction operation health and safety (Bala *et al.*, 2009: 251-259; Enshassi *et al.*, 2009: 269-280; Halim *et al.*, 2010: 28-39; Hani, Ibrahim & Khalid, 2013: 125-134; Ibrahim *et al.*, 2014: 1-15).

Studies on construction business financial management identified various factors that emphasise the management of the organisation's financial activities in the realisation of the overall business strategy,

and to achieve the strategic mission and objective of the finance unit of the organisation (Peterson, 2007; 2009; Wang, Gafy & Zha, 2010: 970-879; Fatoye, 2012: 575). Cheah and Garvin (2004: 176-188) argue that any business enterprise should consider financial factors such as cash for construction work (Wang *et al.*, 2010); construction profit margin (Halim *et al.*, 2010: 28-39); accessibility to building construction loan (Peterson, 2009); interest on loan (Eyiah & Cook, 2003: 357-367); credit purchase of construction material (Peterson, 2007); cost of plant and equipment purchase, maintenance and hiring (Adams, 1997); prompt payment of work certificate (Fatoye, 2012: 575); cost of construction labour (Hegazy, Shabeeb, Elbeltagi & Cheema, 2000: 414-421), and cost of construction material (Wahab & Lawal, 2011: 246-254).

Studies on management of construction operations and business organisation highlight the importance of managerial capacity and capability in the construction business. The following factors were identified: management of construction site material (Gulghane & Khandve 2015: 59-64; Alanjari, Razavialavi & AbouRizk, 2014: 1-8); predictability of construction cost and time (Aje, Odusami & Ogunsemi, 2009); management of construction site labour, plant and equipment (Jarkas & Bitar, 2012: 811-821; Kuroshi & Lawal, 2014: 82-92); organisational competence and client satisfaction (Yu, Kim, Jung & Chung, 2007: 13-139); quality of service and works (El-Mashaleh, Minchin & Brien, 2007: 10-17); employee satisfaction (Nudurupati, Arshad & Turner, 2007: 667-676), and reputation of good client-contractor relationships (Chinyio, Olomolaiye & Corbett, 1998: 385-396).

Construction business evaluation and market environment studies argue that construction firms' success and failure are best assessed over time by factors including age of operation (Kale & Arditi, 1999); firm size (Huang, 2009); firm's impact on the community (Bala *et al.*, 2009: 251-259); tax (Abidali & Harris, 1995: 189-196); inflation (Semyalo, Alaitwe & Kerali, 2012: 263); corruption (Alabi, 2010: 605); construction work turnover and successful tender rates (Kangari, Farid & Elgharib, 1992: 349-361); tendering practices (Kim & Reinschmidt, 2006: 955-965); government policy (Bala *et al.*, 2009: 251-259), and bad weather and natural disaster (Alincitwe, Mwakali & Hansson, 2007).

Construction business technical competence finds expression in technical strength, structure, depth, capability, and capacity. High-performance contractors are known to have great experience, thus minimising the technical risk and resulting in the management of

the only remaining risk that can minimise their profit. They provide high quality for the lowest possible price, due to their technical expertise. The following factors influence the technical viability of construction business: construction technical expertise (Yu, Kim & Chin, 2007: 131-139); quality of construction work and services (Wang *et al.*, 2010: 979-979); specialisation of construction work (Koksal & Arditi, 2004: 799-807); advanced construction technology (Koksal & Arditi, 2004: 799-807), and a number of high-performing professionals (Ramirez, Alarco & Knights, 2004: 110-117).

Construction safety has become a big concern, because the construction industry worldwide is notorious for unacceptable high accident and fatality rates (Fang, Huang & Hinze, 2004; Ulang, Gibb & Anumba, 2010; Sidumedi, 2009). Construction workers are six times more likely to be killed at work than those in other industries (Odeyinka, Davidson & Olomolaiye, 2005: 905). The following performance factors and measures border on construction health and safety influences on the viability of construction business: incident rate (Odeyinka *et al.*, 2005: 905); accident cost (Fang *et al.*, 2004: 424-432), and availability of safety equipment (Lingard & Homles, 2001: 217-226).

2.3 Factors influencing professionalism in the viability of the construction industry

Professionalism is the combination of all qualities that relate to trained and skilled people using consistency and integrity in applying their skills and competencies for the benefit of the community (Aho, 2013: 110; Mcintosh, 2013). This implies that professionalism in the LCFs is expected to strategically benefit the firms, their clients and the community in which they operate. Factors influencing professionalism are factors that influence qualities connected with trained and skilled people in the construction business. These factors include: organisational competence, employee and client satisfaction (Yu *et al.*, 2007: 131-139); quality of work and services (El-Mashaleh *et al.*, 2007: 10-17); reputation of good client-contractor relationships (Chinyio *et al.*, 1998: 385-395); management of construction site material (Gulghane & Khandve, 2015: 59-64; Alanjari *et al.*, 2014: 1-8); management of construction site labour, plant and equipment (Jarkas & Bitar, 2012: 811-821; Kuroshi & Lawal, 2014: 82-92); predictability of construction cost and time (Aje *et al.*, 2009), and availability of skilled labour (Awe, 2006). These factors are categorised under management of construction operation and emphasise the importance of adequate managerial skills capacity and capability fuelled by organisational competence formation and development in improving construction operation,

which is a major goal of professionalism (Silva, Lima & Costa, 2013: 76; Lee, Kim & Lee, 2011: 781).

Professionalism requires a high level of competency (Lee *et al.*, 2011: 781). Competence is based on knowledge, skills, personal characteristics, and a person's demonstrable performance (Medina & Medina, 2015: 279-299). The competence of individual employees within an organisation determines how well the organisation functions. Commitment to scholarship and life-long learning for improved and high competency is a major characteristic of professionalism and is important for construction business technical competence (Kinsingers, 2005: 33-37; Hager, 2017: 203-228; Oladimeji, 2017: 38). Technical professionalism is known to influence LCFs' viability and construction technical expertise (Yu *et al.*, 2007: 131-139); specialisation of construction work (Koksal & Arditi, 2004: 799-807); number of high-performing professionals (Ramirez *et al.*, 2004: 110-117), and advanced construction technology (Koksal & Arditi, 2004: 799-807).

Corruption (Alabi, 2010: 605-613) and a firm's impact on the community (Bala *et al.*, 2009: 251-259) are viability-influencing factors that reflect on professional ethics, attitude and appearance, which are important features of professionalism (Kinsingers, 2005: 33-37).

Professional ethics uphold and influence the quality of construction projects (Abdul-Rahman, Wang & Yap, 2010: 3742-3749). Corruption thrives in the absence of ethics expected to negate corruption-fuelling vices such as immorality, opacity, unfairness, procedural violation, and contractual violation (Shan, Le, Yiu, Chan & Hu, 2017). Professionalism in the construction industry has not been able to curb the menace of corruption, and the industry has been regarded as the most corrupt sector in the world, where corruption has resulted in underperformance, cost overrun, and quality defects (Kenny, 2012: 18-22; Transparency International 2011; Tabish & Jha, 2012: 21-35).

Availability of safety equipment (Lingard & Holmes, 2001: 217-226) and incident rate (Odeyinka *et al.*, 2005: 905-913) are influenced by good professional conduct in upholding the tenants of construction health and safety rules and standard. Professionalism in construction health and safety will be better enhanced through firms' and government's commitment in instituting and enforcing a regulatory framework that will ensure strict compliance with safety regulations and health education to construction employees (Okoye & Okolie, 2013: 76). Although Ozmec, Karlsen, Kines and Andersen, (2015: 275) observed that safety practice communicated and learned within small construction companies was most of the time more a matter of

professionalism and individual mastering; firms had limited impact on employees' daily safety practices.

Having identified the various factors influencing professionalism in the viability of construction business, it is necessary to determine their place in the viability of the LCFs.

3. Research method

The purpose of this research is to identify and examine various factors related to professionalism from diverse elements influencing a firm's viability in the construction industry, in order to determine the place of professionalism in the viability of LCFs. A qualitative research design was used, in which structured questionnaire surveys enable researchers to generalise their findings from a sampled population (Bryman, 2012: 232; Creswell, 2014). In the questionnaire, 37 factors influencing the viability of construction firms were extracted from extant literature and set as the variables of factors influencing the viability of construction firms, out of which 19 were identified as factors that directly influence professionalism in the construction industry. Questions on how important each of the 37 factors are in the viability of LCFs were extracted in their level of importance (Pallant, 2013: 192). Principal component analysis (PCA) was used to reduce these measured variables to smaller factors influencing viability and professionalism. PCA was used, because the Eigenvalues, which explain whether the factors tested had or had not a noticeable effect on people's responses to the variables in the original test, will easily be extracted (Rossoni, Engelbert & Bellegard, 2016: 201; Pallant, 2013: 192).

3.1 Sampling method and response rate

From a preliminary study by the authors, a total of 79 new building projects were awarded from 2005 to 2015 in the study area. Primary data were sourced from 59 LCFs with audited financial statements that were awarded building construction contracts by Federal Universities and Federal University Teaching Hospitals. Using purposive sampling (Etikan, Musa & Alkassim, 2016: 2), 23 LCFs in Lagos were selected in preference to Ogun State, due to its vast physical development, strategic location and very high concentration of infrastructural development. In Ondo, 12 LCFs were selected in preference to Ekiti to represent one of the oldest states in the region; the Federal University located there is much larger and older than the Federal University in Ekiti state. In Osun, 24 LCFs were selected in preference to Oyo to represent one of the newest states

in Southwest Nigeria. Although the sample size is not valid and not within the recommended sample size of 63 for a population equal to or above 75 (Krejcie & Morgan, 1970: 608), the LCFs with audited financial statements chosen substantiate the size of the sample.

Table 1 indicates that there were 59 firms, with 18 in UNILAG, 14 in OAU, 12 in FUTA, 5 in LUTH, and 10 in OAUTHC. The study surveyed managing directors or their representatives and two other professional members of staff who had engaged in construction works in the sampled LCFs. This brings the total number of expected surveyed firms' respondents to 177. However, a total number of 31 firms comprising of 65 respondents' questionnaires were completed, returned and found useful for analysis. This represented a response rate of 36.7% of all participating staff and 53% of the total surveyed firms. According to Ellhag and Boussabaine (1999: 473-480) and Idrus and Newman (2002: 13-19), this is good enough in construction management studies.

Table 1: Number of sampled local construction firms

<i>States</i>	<i>Institutions</i>	<i>Total surveyed firms</i>	<i>Total surveyed personnel of firms</i>	<i>Total firms that responded</i>	<i>Total questionnaires fit for analysis</i>
Lagos	UNILAG	18	54	3	6
	LUTH	5	15	2	2
Ondo	FUTA	12	36	10	19
Osun	OAU	14	42	10	25
	OAUTHC	10	30	6	13
Total		59	177	31	65

3.2 Data collection

Campuses with a total number of 59 LCFs of awarded building construction contracts between 2005 and 2015 were surveyed. The drop-and-collect method was used in places where contractors are actively on site, while personal contact interviews were used in areas where there is sparse construction activity. The questionnaire for this study was divided into three parts, which introduced the topic and instructions to be followed by the respondents. The first part elicited general information about the respondents and their company such as years of experience, professional qualifications, years of establishment, construction operation base, average annual cost of construction, location of firms and construction operations, firms' client types, and grades.

The second part, which was made up of 37 variables influencing the viability of LCFs in Nigeria and subtitled survival of construction business, was based on a 5-point Likert scale rating. Respondents were expected to choose the appropriate scale ranging from not important to extremely important, in order to express their views on the level of importance of each of the enumerated factors on the viability of LCFs in the study area.

3.3 Analysis method and how to interpret data

The Statistical Package for the Social Sciences (SPSS) version 15 was used to conduct descriptive and inferential statistics of the data, computing the frequencies, mean scores, and standard deviations. SPSS was also used to determine the feasibility of conducting a PCA of the 37 factors influencing LCFs' viability survey results.

A 5-point Likert scale was used to rank the importance of the 37 factors. Likert-type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (Bowling, 1997; Leedy & Ormrod, 2014). The following scale measurement was used regarding mean scores, where 1 = Not important (≥ 1.00 and ≤ 1.80); 2 = Fairly important (≥ 1.81 and ≤ 2.60); 3 = Important (≥ 2.61 and ≤ 3.40); 4 = Very important (≥ 3.41 and ≤ 4.20), and 5 = Extremely important (≥ 4.21 and ≤ 5.00).

For analysis of the internal reliability of the factors in the questions on viability, Cronbach's *alpha* values were tested and acceptable values of Cronbach's *alpha* would range from 0.70 to 0.95 (Tavakol & Dennick, 2011: 53-55). A cut-off value of 0.7 was adopted in this study. The optimal inter-item correlations mean (factor loadings) should range from 0.2 to 0.4, in order for the factor to be reliable (Pallant, 2013). However, this study adopted a value of 0.4 and above.

Kaiser-Meyer-Olkin (KMO) test (Lorenzo-Seva, Timmerman & Kiers, 2011: 340-364; Kaiser, 1994: 31-36) was used to confirm whether the data from the measurements was sufficient for factor analysis. KMO test values vary from 0 to 1, values above 0.5 are recommended as being desirable for applying factor analysis (Field, 2000). Bartlett's sphericity test was also performed, and a statistically significant Bartlett test ($p < 0.05$) indicates that sufficient correlations exist among variables, indicating that analysis can continue (Field, 2000).

Principal Components Analysis (PCA) was used for factor extraction so as to summarise most of the information into a minimum number of factors, by concentrating the explanatory power on factors with the highest Eigenvalues in each component (Rossoni *et al.*, 2016: 198-211).

In PCA, when the number of variables (measures) is between 20 and 50, it is more reliable to use Eigenvalues to extract factors, as it makes interpretation simpler (Johnson & Wichern, 2007). The highest Eigenvalue of data in each component is, therefore, the principal component that is retained to form a set of few new variables.

3.4 Limitations

Findings in this study may not be generalised, as the study was not conducted across Nigeria.

4. Results and discussion

4.1 Respondents' profile

The highest percentage of respondents was construction professionals (36.9%), followed by contract managers (20%), and site managers (29.2%). Approximately 50% of the LCFs surveyed had over 10 years' experience, and over 70% of the firms have been in operation for over 10 years. In addition, over 50% of the firms have executed over 11 construction projects and most of the firms operate in Nigeria alone (86.2%) and are mainly patronised by both the private and the public sectors in Nigeria. Although a few of them did not give the detail of their turnover, 52.3% of the respondents claimed that their firms had a turnover of between N10 million to N150 million (\$54.6 thousand to \$815.2 thousand) in 2014, while 13.8% of the firms had a turnover of over N150 million. These characteristics suggest that respondents have the exposure and long-term experiences to be able to give substantial information that could help in making useful inferences and deductions on factors influencing the viability of LCFs.

4.2 Ranking of factors influencing the viability of LCFs and the place of professionalism

Table 2 shows the mean score, standard deviation, and ranking of the 37 factors identified from construction literature as factors influencing the viability of construction firms. The rank of each variable was determined by calculating the mean score (MS), which is the sum of scores of the respondents on the variable divided by the total number of respondents, and subsequently arranged in a rank order. The Cronbach's *alpha* was greater than 0.70 at 0.897, indicating acceptable internal reliability, as recommended by Hair, Black, Babin and Anderson (2014). The Kaiser-Meyer-Olkin (KMO) of 0.551 and Bartlett's Test of Sphericity of $p < 0.000$, which indicates consistency with the recommended KMO, cut-off value of above

0.50 and Bartlett's Test of Sphericity of $p < 0.05$ was satisfied, as suggested by Field (2000). These results suggest that PCA could be conducted with the data.

Table 2: Mean scores and ranking of factors influencing the viability of LCFs

Variable	Factors influencing the viability of LCFs (N = 65) (1 = not important 5 = extremely important)	Bartlett's Test of Sphericity value = 0.00		Kaiser-Meyer-Olkin value = 0.551
		MS	Cronbach's Alpha	Rank
V14	*Organisational competence/client satisfaction	4.40	0.892	1
V1	Cash for construction work	4.36	0.899	2
V15	*Quality of work and services	4.31	0.893	3
V31	*Quality of construction work and services	4.30	0.896	4
V25	*Availability of skilled labour	4.16	0.894	5
V6	Prompt payment of work certificate	4.16	0.895	5
V9	Cost of construction material	4.08	0.893	7
V16	*Employee satisfaction	4.06	0.894	8
V17	*Reputation of good client-contractor relationship	4.00	0.894	9
V26	*Availability of artisans and craftsmen	4.00	0.894	9
V11	*Management of construction site material	3.98	0.892	11
V13	*Management of construction site labour, plant and equipment	3.94	0.895	12
V28	Government policy	3.91	0.895	13
V37	*Availability of safety equipment	3.91	0.894	13
V30	*Construction technical expertise	3.86	0.893	15
V27	Procurement practices (The way in which the contract is awarded)	3.84	0.896	16
V8	Cost of construction labour	3.81	0.894	17
V24	Construction work turnover/successful tender rate	3.81	0.894	18
V32	*Specialisation of contractors' work	3.77	0.895	19
V34	*Number of high-performance professionals	3.77	0.895	19
V12	*Predictability of construction cost and time	3.73	0.893	21
V10	*Project organisation structure	3.73	0.894	22

Table 2: Continued.

Variable	Factors influencing the viability of LCFs (N = 65) (1 = not important ... 5 = extremely important)	Bartlett's Test of Sphericity value = 0.00		Kaiser-Meyer-Olkin value = 0.551
		MS	Cronbach's Alpha	Rank
V2	Construction profit margin	3.66	0.899	23
V33	*Advanced construction technology	3.64	0.894	24
V7	Cost of plant and equipment purchase, maintenance and hiring	3.56	0.892	25
V21	Inflation	3.55	0.900	26
V22	Tax	3.48	0.897	27
V29	Bad weather and natural disaster	3.45	0.894	28
V3	Accessibility to loan	3.44	0.896	29
V4	Interest on loan	3.20	0.898	30
V23	*Corruption	3.20	0.898	31
V5	Credit purchase of material	3.17	0.898	32
V35	*Incident rate	3.17	0.893	32
V18	Age of operation	3.17	0.894	32
V20	*Firm impact on community	3.13	0.895	35
V36	Accident cost	3.03	0.892	36
V19	Firm size	2.92	0.895	37
	Average	3.72	0.897	

* factors that directly influence professionalism

An overview of the MS and ranking of factors influencing the viability of LCFs in Table 2 shows that all the factors have MS greater than 2.9 and the average mean is 3.72. This infers that all the identified factors are at least "important factors" and, on average, "very important factors" influencing the viability of LCFs. Three of the four "extremely important" factors are professionalism-influencing factors. The first 10 factors had MS equal to or greater than 4.00, indicating "very" and "extremely" important factors of all the identified viability-influencing factors in Table 2. These factors cut across clients' satisfaction, and financial perspective of the construction business. Six of these factors are clients' satisfaction-based perspective, while three are finance based. Clients' satisfaction-based perspective factors influence professionalism: organisational competence ranked first, quality of work and services ranked third and quality of construction work and services, and availability of skilled labour ranked fourth and fifth, respectively.

Furthermore, reputation of good client-contractor relationships and availability of artisans and craftsmen, both of which ranked ninth, are also clients' satisfaction-based perspective. The employee satisfaction factor ranked eighth could either be influenced by either or both client satisfaction and finance-based factors. These factors emphasise meeting values and expectations of customers and this is a core definition of professionalism (Aho, 2013: 110-114). Professionalism can satisfy time, cost and quality expectations in the execution of construction projects when well harnessed, and it can be improved by developing competency through manpower development (Lee *et al.*, 2011). The combination of transformational leadership and technology (a good display of professionalism) has been observed to lead to satisfaction of employees and to increase workplace efficiency, resulting in higher performance (Misra & Srivastava, 2018: 117). Abdul-Rahman *et al.* (2010: 3742-3749) noted that the majority of quality-related issues are significantly influenced by the human factor, a function of professional ethics in professionalism. Meanwhile, in Table 2, out of the total 37 identified factors influencing viability, 19 factors directly influence professionalism in LCFs. This represents 51.35% of the total identified factors. It can be inferred from these findings that factors influencing professionalism largely influence the viability of LCFs.

4.3 Principal component analysis for factors influencing professionalism and the viability of LCFs

The 37 variables measuring the viability of LCFs were subjected to PCA to study the trend of inter-correlations between variables and to group these variables with similar characteristics into a set of reduced factors according to the hidden components in the collected data. The results report the factor extraction, Eigenvalues, correlation, and interpretation.

In Figure 1, the scree plot consists of the Eigenvalues and the data points above the break (point of inflexion), which are the components that are meaningful to retain for rotation. Using a cut-off value of initial Eigenvalues greater than one (>1.0), 11 components explain a cumulative variance of 73.75%.

The scree plot confirms the finding of retaining 11 components. As a result, components 12 to 37 are not significant and thus not included for rotation. Table 3 shows the 11 component factors that are meaningful to retain. Factor one explains 25.052% of the total variance; factor two, 8.7685%; factor three, 7.661%; factor four, 5.483%; factor five, 4.962%; factor six, 4.527%; factor seven, 3.999%; factor eight, 3.713%; factor nine, 3.602%; factor ten, 3.096%, and factor eleven, 2.890%.

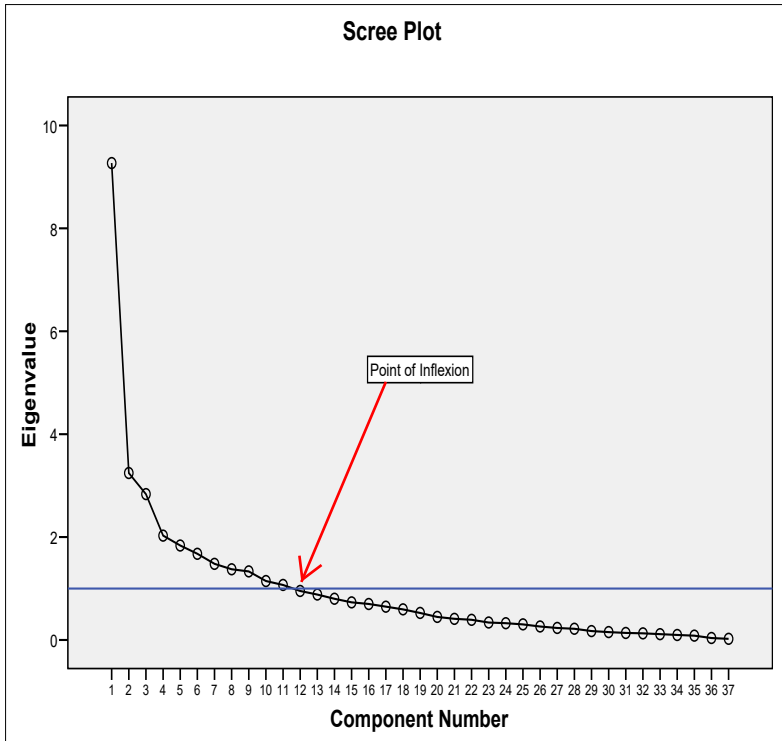


Table 3: Total variance explained – extraction method: Principal component analysis

Component	Initial Eigenvalues		
	Total	% variance	Cumulative %
1	9.269	25.052	25.052
2	3.244	8.768	33.820
3	2.835	7.661	41.482
4	2.029	5.483	46.964
5	1.836	4.962	51.926
6	1.675	4.527	56.453
7	1.480	3.999	60.453
8	1.374	3.713	64.166
9	1.333	3.602	67.768
10	1.146	3.096	70.865
11	1.069	2.890	73.754

The grouping of variables was based on their factor loadings. A factor loading indicates the degree of association of a variable with the component and the percentage variance of the component that is explained by the variable. Variables with the highest factor loading in one component belong to that component; the highest factor loading must be of significant value of 0.4 and above (see Table 4). Correlation exists between variables 10, 11, 12, 13, 19, 30, and 37, as they are loaded onto Component 1, referred to as construction resources. Correlations were identified between variables 31, 32, 33, and 34, which are loaded onto Component 2, referred to as improved construction method. Variables 12, 14, 15, and 16 show correlation as they are loaded onto Component 3, referred to as quality service and satisfactions. Correlations exist between variables 9, 29, 35, and 36, which all loaded onto Component 4, referred to as health and safety. Correlations were identified between variables 17, 24, 25, 26, and 30, which are loaded onto Component 5, referred to as availability of skilled labour. Variables 3, 4, 5, and 23 show correlation as they are loaded onto Component 6, referred to as corruption and loan. Variables 17, 27, and 28 show correlation as they are loaded onto Component 7, referred to as government policy and procurement. Variables 1, 6, 7, 8, and 9 show correlation as they are loaded onto Component 8, referred to as cash for construction work. Variables 21 and 22 show correlation as they are loaded onto Component 9, referred to as tax and inflation. Variables 20 and 24 show correlation as they are loaded onto Component 10, referred to as firm's impact on the community. Variables 2, 5, and 24 show correlation as they are loaded onto Component 11, referred to as profit margin.

Table 4 shows 11 component factors that are meant to describe all identified factors determining the viability of LCFs. It is interesting to note that seven of the 11 factors have at least one high-scoring variable that are factors directly influencing professionalism. In addition, 14 of the 15 variables loaded on the first three component factors are variables factors directly influencing professionalism in LCFs (see *variables in Table 4). These observations stress the significant relevance of professionalism in the viability of LCFs. To achieve the specific aim of this study, only the 7 component factors having factors influencing professionalism (component factors 1 to 6 and 10) are discussed below.

Table 4: Rotated component matrix for factors influencing the viability of LCFs

Variables 1		Component											Communality
		2	3	4	5	6	7	8	9	10	11		
		Construction resources	Improved construction method	Quality service and satisfaction	Health and safety	Availability of skilled labour	Corruption and loan	Procurement practices and policy	Cash for construction	Tax and inflation	Firm's impact on community	Profit margin	
V1	Cash for construction work								.793				.769
V2	Construction profit margin											.924	.898
V3	Accessibility to loan						.726						.641
V4	Interest on loan						.582						.652
V5	Credit purchase of material						.491					.453	.749
V6	Prompt payment of work certificate								.464				.725
V7	Cost of plant and equipment purchase maintenance and hiring								.401				.671
V8	Cost of construction labour								.508				.618
V9	Cost of construction material				.419				.494				.679
V10	*Project organisation structure	.782											.761
V11	*Management of construction site material	.691											.809
V12	*Predictability of construction cost and time	.481		.446									.722
V13	*Management of construction site labour, plant and equipment	.749											.658
V14	*Organisational competence/ client satisfaction			.786									.814

Table 4: Continued.

Variables 1		Component											Communality
		2	3	4	5	6	7	8	9	10	11		
		Construction resources	Improved construction method	Quality service and satisfaction	Health and safety	Availability of skilled labour	Corruption and loan	Procurement practices and policy	Cash for construction	Tax and inflation	Firm's impact on community	Profit margin	
V15	*Quality of service and works			.839									.878
V16	*Employee satisfaction			.604									.694
V17	*Reputation of good client-contractor relationship					.514		.522					.798
V18	Age of operation												.744
V19	Firm size	.597											.781
V20	*Firm's impact on the community										.613		.669
V21	Inflation								.671				.666
V22	Tax								.776				.673
V23	*Corruption						.706						.724
V24	Construction work turnover/ successful tender rate					.461					.435	.447	.800
V25	*Availability of skilled labour					.520							.616
V26	*Availability of artisans and craftsmen					.775							.788
V27	Procurement practices (The way in which the contract is awarded)							.787					.714
V28	Government policy							.725					.783
V29	Bad weather and natural disaster				.648								.649
V30	*Construction technical expertise	.427				.435							.643
V31	*Quality of construction work and services		.464										.849

Table 4: Continued.

Variables 1		Component											Communality
		2	3	4	5	6	7	8	9	10	11		
		Construction resources	Improved construction method	Quality service and satisfaction	Health and safety	Availability of skilled labour	Corruption and loan	Procurement practices and policy	Cash for construction	Tax and inflation	Firm's impact on community	Profit margin	
V32	*Specialisation of construction work		.794										.741
V33	*Advanced construction technology		.884										.874
V34	*Number of high-performance professionals		.779										.761
V35	*Incident rate				.735								.734
V36	Accident cost				.784								.814
V37	*Availability of safety equipment	.528											.733

**factors that directly influence professionalism*

In **Factor 1: Construction resources** (Component 1), the variables with high loading are project organisational structure (0.782); management of construction site labour, plant and equipment (0.749), and management of construction site material (0.691). Gulghane and Khandve (2015: 59-64) and Alanjari, Mwakali and Hansson (2014: 1-8) emphasised the importance of adequate management of construction resources (material, labour, plant, and equipment) in the viability of construction firms; this is also a major goal of professionalism. Each construction project should be well planned for the overall construction firm's survival. It requires professional competence to harness construction labour, material, plant, and equipment on each project in such a way as to gain construction cost and time (Misra & Srivastava, 2018: 109-122). Che Wan Putra, Ahmad, Abd Majid and Kasim (1999) as well as Edwards and Holt (2001: 417-427) noted in summary that the result of improper handling and managing material, plant, and equipment on site during a construction process will influence the total cost, time, and quality of the construction work. It is expected that a well-organised and

-positioned construction project management structure on each site will go a long way in representing and protecting firms' interest well in effective management of all its resources for improved production.

In **Factor 2: Improved construction method** (Component 2), the variables with high loading are advanced construction technology (0.884); specialisation of construction work (0.794), and number of high-performance professionals (0.779). In the United States, Koksai and Arditi (2004: 799-807) found advanced construction and specialisation in construction as essential factors of the 11 factors used in measuring a company's healthiness. The three professionalism-influencing variables in this component are essential to improving construction works delivery and they are core improvement drive and expectations in professionalism to attain a better offer to clients. This implies that high-quality construction products and material can be harnessed and used at the lowest possible price, due to good technical expertise (Misra & Srivastava, 2018: 109-122).

In **Factor 3: Quality service and satisfaction** (Component 3), the variables with high loading are quality of service and work (0.839); organisational competence/client satisfaction (0.786), and employee satisfaction (0.604). El-Mashaleh (2003) and El-Mashaleh *et al.* (2007: 10-17) acknowledge that customer satisfaction is an important performance, while employee satisfaction was noted by Nudurupati *et al.* (2007: 667-676) in a study on performance measurement in the construction industry in the United Kingdom. These indicators show the effect of clients' and employees' satisfaction and quality of service delivery on the viability of construction firms obtained in this analysis. This is also directly related to the goal of professionalism in the construction industry. The satisfaction of customers and other interested parties is necessary for the success of LCFs. Increasing the satisfaction of customers and stakeholders through effective goal development, cost reduction, productivity, and process improvement has proved to be essential for organisations to stay in operation (Oakland & Marosszeky, 2006). Professional ethics is an important branch of professionalism and a prerequisite in attaining sustained and acceptable quality in construction output (Abdul-Rahman *et al.*, 2010: 3742-3749).

In **Factor 4: Health and safety** (Component 4), the variable with high loading is incident rate (0.735). There has been great concern on incident rates in the construction industry. Construction has been noted for the "unacceptable high rate of death, injury and ill health associated with all types of projects" (Cheetham, 2000: 442-451). The Construction Design and Management Regulation 1994 has

charged construction professionals to reduce incident rates by demonstrating a higher level of professionalism through designing out and minimising risk associated with the construction, maintenance, and demolition of buildings. The Construction Health and Safety Summit 2001 (HSE, 2003) published a discussion document setting out ideas for improvement and change. The document is targeted at everyone connected with the construction industry in the United Kingdom and highlights the need to change attitudes to health and safety, in order to prevent accidents (HSE, 2002). Workers' behaviour is an extremely important factor in workplace safety, as many accidents are often caused by insecure actions that are combinations of human behaviour (Rahmana, Shamsuddin & Ghania, 2015: 624). Safety is expected to be a matter of professionalism and individual mastering, as engaging incompetent personnel and non-vibrant professionals are among the causes of accidents (Lubega, Kiggundu & Tindiwensi, 2000; Ozmec *et al.*, 2015). It will take a high level of professionalism to inculcate a safety noble attitude in order to drastically reduce incident rates geared towards ensuring a virile construction industry.

In **Factor 5: Availability of skilled labour** (Component 5), the variables with high loading are availability of artisans and craftsmen (0.775), and availability of skilled labour (0.520). This factor underscores the importance of the availability of all relevant construction skilled personnel, artisans and craftsmen of all trades and professions in executing construction works. Two of the most critical challenges facing the construction industry are the limited number of skilled labour and the increasing need for productivity and cost effectiveness (Hegazy *et al.*, 2000; Bala *et al.*, 2009: 251-259). Going by the definition of professionalism by Mcintosh (2013), which defined Professionalism as "the combination of all qualities that are connected with trained and skilled people", the availability of skilled labour including artisans and craftsmen injects true professionalism in the construction industry, thereby improving productivity.

In **Factor 6: Corruption and loan** (Component 6), the corruption variable has a high loading of 0.706. The construction industry is perceived to be more susceptible to unethical tendencies, due to its complex features and fragmented operations (Oyewobi, Ganiyu, Oke, Ola-Awo & Shittu, 2011: 175-182). Corruption is considered unethical professional behaviour and it is expected that professional ethics, an important feature of professionalism in the construction industry, should curb the menace of corruption. Adeyemo and Amade (2016: 1-14) recommend that construction professionals should uphold the ethics of their profession and shun

corruptible tendencies such as bribery to win a contract, avoid overbidding, cover, extra and false pricing during the tendering stage. A demonstration of required professional ethics will mitigate construction project failure, ensuring more healthy construction firms. Usman, Inuwa and Iro (2012: 124-128) noted that most of the construction firms fail as a result of corruption.

In **Factor 10: Firm's impact on the community** (Component 10), firm's impact on the community variable has a high loading of 0.613. Professionalism improves production, as observed in the preceding discussion, ultimately leading the LCFs to adequately meet their profit drive and able to fulfil the corporate social responsibility that can trigger growth and development in both the community and the firm (Salama, Anderson & Tom, 2011). This resembles Aho's (2013: 110-114) definition of sustainable professionalism, which means consistency and integrity in applying one's skill and competencies for the benefits of the community.

5. Conclusion

This study identified and examined various factors closely related to professionalism in LCFs. These factors were obtained from factors determining the viability of construction firms. The study analysed the level of importance of 37 factors influencing the viability of construction firms based on extant literature via a questionnaire requiring respondents to rate the factors as they were perceived. Of all the 37 factors, 19 are factors directly related to professionalism. Seven of the first 10 factors, which are considered "very important" and "extremely important", directly influence professionalism. Each of the 7 factors had a weighted average score higher than 3.90. These factors are organisational competence/client satisfaction, quality of construction work and services, availability of skilled labour, employee satisfaction, reputation of good client-contractor relationships, and availability of artisans and craftsmen.

Correlation of the various factors influencing LCFs' viability using PCA identified 11 component factors, of which 7 have high factor loadings of various factors that majorly influence professionalism in the construction industry. These labelled 7 component factors and their various factors influencing professionalism are "construction resources" factors V10 to V13, V30, and V37; "improved construction method", factors V31 to V34; "quality service and satisfaction", V12 and V14 to V16; "health and safety", V3; "availability of skilled labour", V17, V24 to V26, and V30; "corruption and loan", V23, and "firm's impact on community", V20.

It is obvious from the results of the analysis and discussion that the place of professionalism in LCFs is cardinal and significantly influences the viability of LCFs. This should trigger a frantic call to various professionals in the construction industry to demonstrate their effectiveness in good service delivery and ethics. It is important that professionals put more effort into becoming key players in formulating policy recommendations, initiating technical standards and regulatory framework for LCFs. Professionals should enhance their relevance and value in strategic identified areas in improving the healthy growth and development of local construction business, most of which are small-scale industry. Meanwhile, small-scale industries are generally noted for catalysing grassroots community and national development and professionals can harness local construction firms to take the lead.

6. Further research

Further research purposely to determine the place of professionalism on viability based on identified professionalism-influencing factors in the construction industry at large is recommended. This study can also be conducted in other African countries for comparative purposes and a more robust perception of the place of professionalism in the viability of local and foreign construction firms.

References

- Abdul-Rahman, H., Wang, C. & Yap, X.W. 2010. How professional ethics impact construction quality: Perception and evidence in a fast-developing economy. *Scientific Research and Essays*, 5(23), pp. 3742-3749.
- Abidali, A.F. & Harris, F. 1995. A methodology predicting failure in the construction industry. *Construction Management and Economics*, 13(3), pp. 189-196. <https://doi.org/10.1080/01446199500000023>
- Adams, O. 1997. Contractor development in Nigeria: Perceptions of contractors and professionals. *Construction Management and Economics*, 15(1), pp.95-108. <https://doi.org/10.1080/014461997373141>
- Adeyemo, A.A. & Amade, B. 2016. Corruption and construction projects in Nigeria: Manifestations and solutions. *PM World Journal*, V(X), pp. 1-14.
- Aho, I. 2013. Value-added business models: Linking professionalism and delivery of sustainability. *Building Research and Information*, 41(1), pp. 110-114. <https://doi.org/10.1080/09613218.2013.736203>

Alabi, F.O. 2010. The macroeconomic review of building and construction sector in Nigeria: Pre-1980-2006. In: Laryea, S., Leiringer, R. & Hughes, W. (Eds). *Proceedings of the West Africa Built Environment Research (WABER) Conference, 27-28 July 2010, Accra, Ghana*, pp. 605-613.

Alinaitwe, H.M., Mwakali, J.A. & Hansson, B. 2007. Factors affecting the productivity of building craftsmen – Studies of Uganda. *Journal of Civil Engineering and Management*, 13(3), pp. 169-176. <https://doi.org/10.3846/13923730.2007.9636434>

Alanjari, P., Razavialavi, S. & AbouRizk, S. 2014. A simulation-based approach for material yard laydown planning. *Automation in Construction*, vol.40, pp.1-8. <https://doi.org/10.1016/j.autcon.2013.12.010>

Aje, O.I., Odusami, K.T. & Ogunsemi, D.R. 2009. The impact of contractors' management capability on cost and time performance of construction projects in Nigeria. *Journal of Financial Management of Property and Construction*, 14(2), pp. 171-87. <https://www.emeraldinsight.com/doi/pdf/10.1108/13664380910977619>

Aniekwu, A. 1995. The business environment of the construction industry in Nigeria. *Construction Management and Economics*, 13(6), pp. 445-455. <https://www.tandfonline.com/doi/abs/10.1080/01446199500000052>

Awe, E.M. 2006. The roles of building technology education in entrepreneurial development in Nigeria. Paper presented at the *Academic Staff Union of Polytechnic (ASUP) Annual National Conference, 7-10 November, Yaba College of Technology, Lagos*.

Bala, K., Bello, A., Kolo, B.A. & Bustani, S.A. 2009. Factors inhibiting the growth of local construction firms in Nigeria. In: Dainty, A. (Ed.). *Proceedings of the 25th Annual ARCOM Conference, 7-9 September 2009, Nottingham, UK: Association of Researchers in Construction Management*, pp. 351-359.

Bryman, A. 2012. *Social research methods*. 4th edition. New York: Oxford University Press.

Business Monitor International. 2007. Nigeria infrastructure annual report 2008. London: BMI researchers.

Bowling, A. 1997. *Research methods in health*. Buckingham: Open University Press.

Chan, J.K.W., Tam, C.M. & Cheung, R.K.C. 2005. Construction firms at the crossroads in Hong Kong. *Engineering, Construction and Architectural Management*, 12(2), pp. 111-124. <https://www.emeraldinsight.com/doi/abs/10.1108/09699980510584476>

Che Wan Putra, F., Ahmad, A., Abd Majid, M.Z. & Kasim, N. 1999. Improving material scheduling for construction industry in Malaysia. In: *Malaysian Science and Technology Congress 99*, 6-8 December, Johor Bahru, Malaysia.

Cheah, C.Y.J. & Garvin, M.J. 2004. An open framework for corporate strategy in construction. *Engineering, Construction and Architectural Management*, 11(3), pp. 176-188. <https://doi.org/10.1108/09699980410535787>

Cheetham, D.W. 2000. Improving site safety-enforcement of the CDM regulations: In: Akintoye, A. (Ed.). *Proceedings of the 16th Annual ARCOM Conference*, 6-8 September, Glasgow Caledonian University, pp. 442-451.

Chinyio, E.A., Olomolaiye P.O. & Corbett, P. 1998. An evaluation of the project needs of UK building clients. *International Journal of Project Management*, 16(6), pp. 385-391. [https://doi.org/10.1016/S0263-7863\(98\)00001-5](https://doi.org/10.1016/S0263-7863(98)00001-5)

Construction Leadership Council. 2013. *Construction 2015 – Industrial Strategy: Government and industry in partnership*. London: HM Government.

Creswell, J.W. 2014. *Research design: Qualitative, quantitative and mixed methods approaches*. 4th edition. Thousand Oaks, CA: Sage.

Edwards, D.J. & Holt, G.D. 2001. Predicting construction plant maintenance expenditure. *Building Research and Information*, 29(6), pp. 417-27. <https://www.tandfonline.com/doi/abs/10.1080/014461900370960>

Ellhag, T.M.S. & Boussabaine, A.H. 1999. Evaluation of construction costs and time attributes. In: Hughes, W. (Ed.) *Proceedings of the 15th ARCOM Conference*. Vol. 2 ARCOM, Liverpool John Moores University, 15-17 September, pp. 473-480.

El-Mashaleh, M. 2003. Firm performance and information technology utilization in the construction industry: An empirical study. Unpublished Ph.D. dissertation. Gainesville, FL: University of Florida.

El-Mashaleh, M., Minchin, R. & O'Brien, W. 2007. Management of construction firm performance using benchmarking. *Journal of Management Engineering*, 23(1), pp. 10-17. [https://doi.org/10.1061/\(ASCE\)0742-597X\(2007\)23:1\(10\)](https://doi.org/10.1061/(ASCE)0742-597X(2007)23:1(10))

Enshassi, A., Mohamed, S. & Abushaban, S. 2009. Factors affecting the performance of construction projects in the Gaza strip. *Journal of Civil Engineering and Management*, 15(3), pp. 269-280. <https://www.tandfonline.com/doi/abs/10.3846/1392-3730.2009.15.269-280>

- Etikan, I., Musa, S.A. & Alkassim, R.S. 2016. Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), pp. 1-4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Eyiah, A.K. & Cook, P. 2003. Financing small and medium-scale contractors in developing countries: A Ghana case study. *Journal of Construction Management and Economics*, vol. 21, pp. 357-367. <https://doi.org/10.1080/0144619032000111241>
- Fagbenle, O.I. 2000. *Impact of non-financial incentive schemes on the productivity of construction operatives in South Western Nigeria*. Unpublished M.Sc. thesis, Obafemi Awolowo University, Ile-Ife, Nigeria.
- Fang, D.P., Huang, X.Y. & Hinze, J. 2004. Benchmarking studies on construction safety management in China. *Journal of Construction Engineering Management*, 130(3), pp. 424-432. [https://doi.org/10.1061/\(ASCE\)0733-9364\(2004\)130:3\(424\)](https://doi.org/10.1061/(ASCE)0733-9364(2004)130:3(424))
- Farmer, M. 2016. *Modernise or die: Time to decide the industry's future*. The Farmer Review of the UK Construction Labour Model. London: Construction Leadership Council.
- Fatoye, E.O. 2012. Contributing factors of delay in the Nigerian construction industry: A comparative analysis with other selected countries. In: Laryea, S., Agyepong, S.A., Leiringer, R. & Hughes, W. (Eds.). *Proceedings of the 4th West Africa Built Environment Research (WABER) Conference, 24-26 July, Abuja, Nigeria*, pp. 575-587.
- Field, A. 2000. *Discovering statistics using SPSS for Windows*. Thousand Oaks, CA: Sage Publications.
- Gulghane, A.A. & Khandve, P.V. 2015. Management of construction materials and control of construction waste in construction industry: A review. *International Journal of Engineering Research and Application*, vol. 5, pp. 59-64.
- Hair, J.F., Black, W.C., Babin, B.J. & Anderson, R.L. 2014. *Multivariate data analysis*. 5th edition. Upper Saddle River, NJ: Prentice Hall.
- Halim, M.S., Jaafar, M., Osman, O. & Akbar, S. 2010. The contracting firm's failure and financial related factors: A case study of Malaysian contracting firms. *International Research Journal of Finance and Economics*, 52, pp. 28-39.
- Hany, A.E.M., Ibrahim, A.A. & Khalid, S.A. 2013. Indicators for measuring performance of building construction companies in the Kingdom of Saudi Arabia. *Journal of King Saud University – Engineering Sciences*, 25(2), pp. 125-134. <https://doi.org/10.1016/j.jksues.2012.03.002>

Hegazy, T., Shabeeb, A.K., Elbeltagi, E. & Cheema, T. 2000. Algorithm for scheduling with multiskilled constrained resources. *Journal of Construction Engineering and Management-ASCE*, 126(6), pp.414-421. [https://doi.org/10.1061/\(ASCE\)0733-9364\(2000\)126:6\(414\)](https://doi.org/10.1061/(ASCE)0733-9364(2000)126:6(414))

HSE (Health and Safety Executive). 2002. *Construction (design and management). Regulations 1994: The role of the designer. Construction Sheet No. 41*. London: HMSO.

HSE (Health and Safety Executive). 2003. HSE reports on construction industry's health and safety performance. Press Release E001:03. [Online]. Available at: <<http://www.hse.gov.uk/press/2003/e03001.htm>> [Accessed: 12 October 2003].

Hager, P. 2017. The integrated view on competence. In: Mulder, M. (Ed.). *Competence-based vocational and professional education*. Switzerland: Springer International, pp. 203-228. https://doi.org/10.1007/978-3-319-41713-4_10

Huang, Y. 2009. Prediction of contractor default probability using structural models of credit risk: An empirical investigation. *Construction Management and Economics*, 27(6), pp. 581-596. www.tandfonline.com/doi/full/10.1080/01446190902960474

Idrus, A.B. & Newman, J.B. 2002. Construction-related factors influencing choice of concrete floor systems. *Journal of Construction Management and Economics*, 20(1), pp. 13-19. <https://www.tandfonline.com/doi/abs/10.1080/01446190110101218>

Ibrahim, I.I., Githae, W. & Stephen, D. 2014. Indigenous contractors' involvement and performance in construction procurement systems in Nigeria. *Global Journal of Researches in Engineering*, 14(1), pp. 1-15.

Idoro, G.I. 2004. The effect of globalization on safety in the construction industry in Nigeria. In: *Proceedings of the International Symposium on Globalization and Construction*, Bangkok, Thailand, pp. 817-826.

Idoro, G.I. 2010. Influence of quality performance on clients' patronage of indigenous and expatriate construction contractors in Nigeria. *Journal of Civil Engineering and Management*, 16(1), pp. 65-73. <https://doi.org/10.3846/jcem.2010.06>

Jarkas, A.M. & Bitar, C.G. 2012. Factors affecting labor productivity in Kuwait. *Journal of Construction Engineering and Management*, 138(7), pp. 811-821. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000501](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000501)

- Johnson, R.A. & Wichern, D.W. 2007. *Applied multivariate statistical analysis*. 6th edition. Upper Saddle River, NJ: Pearson.
- Kale, S. & Arditi, D. 1999. Age-dependent business failures in the US construction industry. *Construction Management and Economics*, 17(4), pp. 493-503. <https://doi.org/10.1080/014461999371411>
- Kaiser, H. 1994. An index of factorial simplicity. *Psychometrika*, vol. 39, pp. 31-36. <https://doi.org/10.1007/BF02291575>
- Kangari, R., Farid, F. & Elgharib, H.M. 1992. Financial performance analysis for construction industry. *Journal of Construction Engineering and Management ASCE*, 118(2), pp.349-361. [https://doi.org/10.1061/\(ASCE\)0733-9364\(1992\)118:2\(349\)](https://doi.org/10.1061/(ASCE)0733-9364(1992)118:2(349))
- Kenny, C. 2012. Publishing construction contracts to improve efficiency and governance. *Proceedings of the Institution of Civil Engineers*, 165(5), pp. 18-22. <https://doi.org/10.1680/cien.11.00007>
- Kim, H.J. & Reinschmidt, K.F. 2006. A dynamic competition model for construction contractors. *Construction Management and Economics*, 24(9), pp. 955-965. <https://doi.org/10.1080/01446190600799729>
- Kinsinger, S. 2005. The set and settings: Professionalism defined. *Journal of Chiropractic Humanities*, vol. 12, pp. 33-37. [https://sci-hub.tw/10.1016/S1556-3499\(13\)60150-3](https://sci-hub.tw/10.1016/S1556-3499(13)60150-3).
- Koksal, A. & Arditi, D. 2004. Predicting construction company decline. *Journal of Construction Engineering and Management ASCE*, 130(6), pp. 799-807. [https://doi.org/10.1061/\(ASCE\)0733-9364\(2004\)130:6\(799\)](https://doi.org/10.1061/(ASCE)0733-9364(2004)130:6(799))
- Krejcie, R.V. & Morgan, D.W. 1970. Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), pp. 607-610. <https://doi.org/10.1177/001316447003000308>
- Kuroshi, P.A. & Lawal, M. 2014. Study of internal factors affecting labour productivity in medium sized construction firms in Nigeria. *International Journal of Education and Research*, 2(12), pp. 83-92.
- Laryea, S. 2010. Challenges and opportunities facing contractors in Ghana. In: Laryea, S., Leiringer, R. & Hughes, W. (Eds.). *Proceedings of the West Africa Built Environment Research (WABER) Conference*, 27-28 July, Accra, Ghana, pp. 215-226.
- Lewis, T.M. 2004. The construction industry in the economy of Trinidad and Tobago. *Construction and Management*, 22(5), pp. 541-549. <https://www.tandfonline.com/doi/abs/10.1080/0144619042000190234>

Leedy, P.D. & Ormrod, J.E. 2014. *Practical research: Planning and design*. 10th edition. Boston: Pearson.

Lee, T.S., Kim, D. & Lee, D.W. 2011. Competency model for project construction team and project control team. *KSCE Journal of Civil Engineering*, 15(5), pp.781-792. <https://doi.org/10.1007/s12205-011-1291-9>

Lingard, H. & Holmes, N. 2001. Understandings of occupational health and safety risk control in small business construction firms: Barriers to implementing technological control. *Construction Management and Economics*, 19(2), pp. 217-226. <https://doi.org/10.1080/01446190010002570>

Lorenzo-Seva, U., Timmerman, M.E. & Kiers, H.A. 2011. The Hull method for selecting the number of common factors. *Multivariate Behavioral Research*, 46(2), pp. 340-364. <https://doi.org/10.1080/00273171.2011.564527>

Lubega, H., Kiggundu, B.M. & Tindiwensi, D. 2000. An investigation into the causes of accidents in the construction industry in Uganda. In: *Proceedings of the 2nd International Conference on Construction in Developing Countries*, 15-17 November, Botswana.

Mbugua, L.M., Harris, P.T., Holt, G.D. & Olomolaiye, P.O. 1999. A framework for determining critical success factors influencing construction business performance. In: Hughes, W. (Ed.). *15th Annual ARCOM Conference*, 15-17 September, Liverpool, John Moores University.

Mcintosh, C. 2013. *Cambridge advanced learner dictionary*. Cambridge: Cambridge University Press.

Medina, R. & Medina, A. 2015. The competence loop: Competence management in knowledge-intensive, project-intensive organizations. *International Journal of Managing Projects in Business*, 8(2), pp. 279-299. doi:10.1108/IJMPB-09-2014-0061

Misra, S. & Srivastava, K.B.L. 2018. Team-building competencies, personal effectiveness and job satisfaction: The mediating effect of transformational leadership and technology. *Management and Studies*, 43(1&2), pp.109-122. DOI: 10.1177/0258042X17753178

Nudurupati, S., Arshad, T. & Turner, T. 2007. Performance measurement in the construction industry: An action case investigating manufacturing methodologies. *Journal of Computer Industry*, 58(7), pp. 667-676. <https://doi.org/10.1016/j.compind.2007.05.005>

Ng, A.K.W. & Price, A.D.F. 2002. Optimizing the performance of subcontractors in building construction projects in Hong Kong. In: Greenwood, D. (Ed.). *Proceedings of the 18th Annual ARCOM Conference, 2-4 September, University of Northumbria: Association of Researchers in Construction Management, 2*, pp. 811-819.

National Bureau of Statistics. 2006. Federal Republic of Nigeria 2006 Population census. [Online]. Available at: <www.nigerianstat.gov.ng> [Accessed: 15 June 2014].

National Bureau of Statistics. 2014. Measuring better: Presentation of preliminary results of the rebased nominal gross domestic product (GDP) estimates for Nigeria 2010 to 2013, delivered by the Statistician-General of the Federation & Chief Executive Officer, National Bureau of Statistics. Federal Republic of Nigeria, Abuja, April 2014.

Oakland, J. & Marosszeky, M. 2006. *Total quality in the construction supply chain*. Oxford: Elsevier Ltd. <https://doi.org/10.4324/9780080455280>

Oke, A. & Falemu, A.J. 2009. Relationship between building collapse and poor quality of material and workmanship in Nigeria. In: *Proceedings of the COBRA 2009 Construction and Building Research Conference of the Royal Institute of Chartered Surveyors*, 10-11 September, Cape Town, South Africa, pp. 873-884.

Oladimeji, O. 2017. Viability of locally owned construction firms in Southwestern Nigeria. Unpublished Ph.D. thesis, Obafemi Awolowo University, Ile-Ife, Nigeria.

Oladimeji, O. & Aina, O.O. 2018. Financial performance of locally owned construction firms in Southwestern Nigeria. *Journal of Financial Management of Property and Construction*, 23(1), pp. 112-128. <https://doi.org/10.1108/JFMPC-01-2017-0003>

Oladapo, A. 2007. An investigation into construction industry. *Journal of Information Technology in Construction*, vol. 12, pp. 261-277.

Olatunji, S., Ajibola, K. & Coker, A. 2000. The effects of training on the productivity of construction craftsmen in South Western Nigeria. In: *Challenges facing the construction industry in developing countries. Proceedings of the 2nd international Conference on Construction in Developing countries*, 15-17 November, The Netherlands, Rotterdam, pp. 1-7.

Olugboyega, A.A. 1995. Indigenous contractors' perceptions of the constraints on contractors' performance and development programmes enquired in Nigeria. *Habitat International*, 19(4), pp. 599-613. [https://doi.org/10.1016/0197-3975\(95\)00020-G](https://doi.org/10.1016/0197-3975(95)00020-G)

Olugboyega, A.A. 1998 .Indigenous contractors' perceptions of the importance of topics for contractor training in Nigeria. *Habitat International*, 22(2), pp. 137-147. <http://www.sciencedirect.com/science/article/pii/S0197397597000325>

Odeyinka, H., Davison, C. & Olomolaiye, P. 2005. An assessment of factors inhibiting designers from complying with health and safety regulations in their design. In: *Proceedings of the 21st Annual ARCOM Conference*, 7-9 September, SOAS, University of London, 2, pp. 905-913.

Ofori, G. 2010. Built environment research and the millenium development goals. In: Laryea, S., Leiringer, R. & Hughes, W. (Eds.). *Proceedings of the West Africa Built Environment Research (WABER) Conference*, 27-28 July 2010, Accra, Ghana, pp. 9-25.

Okoye, P.U. & Okolie, K.C. 2013. Approach to sustainable construction practices through safety culture. *Journal of Engineering Research and Development*, 6(11), pp. 76-83.

Opoko, A.P. 2004. Housing the Nigerian urban poor: Lessons from other countries. *Building Quarterly*, 3(1), pp. 13-17.

Oyewobi, L.O., Ganiyu, B.O., Oke, A.A., Ola-Awo, A.W. & Shittu, A.A. 2011. Determinants of unethical performance in Nigerian construction industry. *Journal of Sustainable Development*, 4(4), pp. 175-182. <https://doi.org/10.5539/jsd.v4n4p175>

Ozmeç, M.N., Karlsen, I.L., Kines, P. & Andersen, L.P.S. 2015. Negotiating safety practice in small construction companies. *Journal of Safety Science*, 71, Part C, pp. 275-281. <http://dx.doi.org/http://dx.doi.org/10.1016/j.ssci.2014.03.016>

Peterson, S.J. 2007. *Construction accounting and financial management*. Upper Saddle River, NJ: Prentice Hall.

Peterson, S.J. 2009. *Construction accounting and financial management*. 2nd edition. Upper Saddle River, NJ: Prentice Hall.

Pallant, J. 2013. *SPSS, survival manual: A step-by-step guide to data analysis using IBM, SPSS*. 5th edition. London: Allen & Unwin.

Rahmana, N.A., Shamsuddin, B. & Ghania, I. 2015. What makes people use the street?: Towards a liveable urban environment in Kuala Lumpur city centre. *Procedia - Social and Behavioral Sciences*, vol.170, pp. 624- 632. <https://doi.org/10.1016/j.sbspro.2015.01.064>

Ramirez, R.R., Alarco, L.F.C. & Knights, P. 2004. Benchmarking system for evaluating management practices in the construction industry. *Journal of Management Engineering*, 20(3), pp. 110-117. [https://doi.org/10.1061/\(ASCE\)0742-597X\(2004\)20:3\(110\)](https://doi.org/10.1061/(ASCE)0742-597X(2004)20:3(110))

Rossoni, L., Engelbert, R. & Bellegard, N.L. 2016. Normal science and its tools: Reviewing the effects of exploratory factor analysis in management. *Revista de Administração*, 51(2), pp. 198-211. <https://doi.org/10.5700/rausp1234>

Salama, A., Anderson K. & Tom, J.S. 2011. Does community and environmental responsibility affect firm risk? Evidence from UK panel data. *Business Ethics: A European Review*, 20(2), pp. 192-204. <https://doi.org/10.1111/j.14678608.2011.01617.x>

Semyalo, C., Alinaitwe, H. & Kerali, A. 2012. Causes of financial loss to contractors in the Uganda construction industry. In: Laryea, S., Agyepong, S.A., Leiringer, R. & Hughes, W. (Eds.). *Proceedings of the 4th West Africa Built Environment Research (WABER) Conference*, 24-26 July, Abuja, Nigeria, pp. 263-274.

Shan, M., Le, Y., Yiu, K.T.W., Chan, A. & Hu, Y. 2017. Investigating the underlying factors of corruption in the construction sector: Evidence from China. *Science Engineering Ethics*, 23(6), pp.1643-1666. Doi 10.1007/s11948-016-9865-z

Silva, M.A., Lima, E.P. & Costa, S.E.G. 2013. Organisational competence building and development: Contributions to operation management. *International Journal of Production Economics*, 144(1), pp. 76-89. <https://doi.org/10.1016/j.ijpe.2013.01.021>

Sidumedi, K.S. 2009. An investigation into the relationship between the corporate culture of South African construction firms and performance. [Online]. Available at: <<http://wiredspace.wits.ac.za/handle/10539/7942>> [Accessed: 28 June 2011].

Sonson, S.J., Kulantunga, U. & Pathirage, C. 2017. Performance measurement and management in construction framework. In: *Proceedings of the 13th International Postgraduate Research Conference (IPGRC)*, 14-15 September, University of Salford, United Kingdom, pp. 16-528.

Tavakol, M. & Dennick, R. 2011. Making sense of Cronbach's *alpha*. *International Journal of Medical Education*, vol. 2, pp. 53-55. <https://doi.org/10.5116/ijme.4dfb.8dfd>

Tabish, S. & Jha, K.N. 2012. The impact of anti-corruption strategies on corruption-free performance in public construction projects. *Construction Management and Economics*, 30(1), pp. 21-35. <https://doi.org/10.1080/01446193.2011.654128>

Transparency International. 2011. Bribe payers 2011. Berlin: Transparency International. [Online]. Available at: <http://archive.transparency.org/tools/contracting/construction_projects> [Accessed: 28 June 2011].

Ulang, N.M., Gibb, A.G.F. & Anumba, C.J. 2010. The communication of health and safety information in construction. In: *Proceedings of the W099 – Special Track 18th CIB World Building Congress*, 10-13 May, Salford, United Kingdom, pp. 265-277.

Usman, N.T., Inuwa, I.I. & Iro, A.I. 2012. The influence of unethical professional practices on the management of construction projects in north-eastern states of Nigeria. *International Journal of Economic Development Research and Investment*, vol. 3, pp. 124-128.

Wahab, A.B. & Lawal, A.F. 2011. An evaluation of waste control measures in construction industry in Nigeria. *African Journal of Environmental Science and Technology*, 5(3), pp. 246-254.

Wang, O., El_Gafy, M. & Zha, J. 2010. Bi-level framework for measuring performance to improve productivity of construction enterprises. *Construction Resource Congress*, vol. 2, pp. 970-979. [https://doi.org/10.1061/411109\(373\)97](https://doi.org/10.1061/411109(373)97)

World Economic Forum and Boston Consulting Group. 2016. *Shaping the future of construction: A breakthrough in mindset and technology*. Geneva: World Economic Forum.

Yu, I., Kim, K., Jung, Y. & Chin, S. 2007. Comparable performance measurement system for construction companies. *Journal of Management Engineering*, 23(3), pp. 131-139. [https://doi.org/10.1061/\(ASCE\)0742-597X\(2007\)23:3\(131\)](https://doi.org/10.1061/(ASCE)0742-597X(2007)23:3(131))