

Critical Factors Limiting the Performance of Small-Scale Construction Firms in Nigeria

Ali I. F.¹, Prof. Awad S.H.² and Dr. Abdulsalam D.³

1. PhD student, College of Engineering, Sudan University of Science and Technology (SUST),

2. College of Engineering, Sudan University of Science and Technology (SUST),

3. Department of Building, Ahmadu Bello University, Zaria.

Abstract: *Small-Scale Construction Firms (SSCFs) in Nigeria contributes significantly to the country's GDP, employment, economic and infrastructural development, so the performance of these SSCFs is very crucial for the country. Therefore, this study identified the critical factors limiting their performance. One hundred and thirteen variables were identified through literature review and focus group discussions with the management and owners of the Small and Medium Scale Construction Enterprises (SMCEs). The 113 variables affecting performance were rated using a questionnaire survey administered to 125 small-scale construction firms. Data collected was analyzed using descriptive statistics and Principal Component Analysis (PCA) using SPSS statistical software. Results revealed five (5) critical factors such as construction firm internal constraints and financial problems that are limiting the performance of construction SMEs and their overall contributions to economic development.*

Keywords: *small-scale constructions firms, problems, critical factors and performance*

Date of Submission: 08-08-2019

Date of acceptance: 25-08-2019

I. Background of the study

Contrary to the general impression, SMEs are as much an important economic catalyst in industrialized countries as they are in the developing world (Ibrahim, 2011; Ogunlana *et al.*, 2003; Bala *et al.*, 2009). In both countries, more than 98% of all enterprises belong to the SME sector as noted by Ihua and Siyanbola, 2012. Past research had stressed the importance of both small and medium scale enterprises in social and economic terms; it employs not less than 25% of the total work force and the largest employer of construction labour in Africa (Ibrahim 2011). They contribute towards the gross domestic product (GDP) and gross value added (GVA) of several nations (Ihua and Siyanbola, 2012). Most developing countries Nigeria inclusive, perceived small businesses and SMEs as the key to economic growth, poverty alleviation and employment generation. Small-scale construction firms are part of the SMEs sector. Despite these impressive acknowledgements and accolades, the SMEs sector in Nigeria still performs far below expectation as a result of several constraints (Agwu and Emeti, 2014, Mafimidowo and Iyagba, 2015, Ibrahim 2011, Aniekwu 1995).

Nations are supposed to nurture their indigenous contractors with available construction projects in order to develop and equip them with the needed experience with which to execute all complexities of national construction challenges and even export construction expertise to other countries. However, the Nigerian government instead developed foreign construction firms to an extent that they can dictate and get contract on their own terms to the government, leaving the local contractors starved of work (Olayeni and Omuh 2010).

As the foreign contractors carry out more jobs they gain better expertise on the job while the Nigerian contractors remain inexperienced and therefore, unable to compete with their foreign counterparts. Akintunde (2003) noted that, foreign construction companies dominate the industry, to the extent that, there is no indigenous Construction Company that can single handedly execute a major engineering project.

Furthermore, the window of opportunity provided by the indigenization decree of 1973 and the local content bill for construction services of 2014, meant to give indigenous construction companies a level playing field as their international counterparts, as well as, making it easier for local businesses to thrive in the industry had not made the expected impact. As international firms still dominate the industry, although the prospect for success still exist. (NBS, 2015; Bala *et al.*, 2009).

Ofori and Lean (2001) shared the view that, the economies of many developing countries are currently confronted by severe difficulties owing to a combination of lower commodity prices, higher energy costs, falling exchange rates and rising inflation. At the same time, the countries face immense social problems such as rising urban population and unemployment, which are putting pressure on the nation resources and capabilities. While Osotimehin *et al.*, (2012) observed that, there is strong correlation between the degree of poverty, hunger, unemployment, economic well-being of the citizens of countries and the degree of vibrancy of the respective country's small-scale enterprises. He added that, Small and Medium Enterprises (SMEs) in Nigeria have not

performed creditably well and hence have not played the expected vital and vibrant role in the economic growth and development of Nigeria.

As noted by Bala*et.al.*, (2009), Osotimehin*et.al.*, (2012) and Fatai, (2011) that, despite government policies and institutional support towards enhancing the capacity of small and medium scale enterprises, construction SMEs are still facing serious constraints and challenges that undermines their performance and survival. Past studies by Zayed, *et.al.*, (2012), Abu-Bakare*et.al.*, (2011); Okoye*et.al.*, (2016); Fox, (2003); Dulaimi and Tan., (2001), Kulemeka*et.al.*, (2015) on the construction industry development focus more on growth or success factors and in most cases, small-scale construction firms have been left out from the sampling framework. However, a pertinent question is, what are the current barriers or challenges that are affecting the performance and growth of small-scale construction firms, because Abu-Bakare*et.al.*, (2011) noted that, as construction firms grow, they are confronted by challenges that must be overcome in order to prosper and developed.

Performance as a concept is often confused with productivity, whereas productivity is a specific concept related to the ratio between output and input of an industry. While performance is a broader concept, that covers both the economic and operational aspect of an industry. Performance refers to excellence, profitability and productivity among other non-cost factors such as; quality, speed delivery and flexibility (Pekuriet al, 2011).

Construction firms can be distinguished from each other, through various means such as, the size of annual turnover, number of employees, plants and equipment holding, capacity and capability standards. However small-scale construction firms in Nigeria hardly employ more than 25 workers with virtually no construction plant and equipment, while their productivity and performance remains relatively low due to cost and time overruns, coupled with poor workmanship (Bilauet.al, 2015, Fatai, 2011 and Ali 2010).

II. Literature Review

Factors Affecting the Performance of Construction SMEs in Developed Countries

Past studies by various authors had noted that, globally small-scale construction firms in several countries faces lot of constraints and problems that tend to limit their ability in handling construction business, (Kirmani, 1988, Ofori, 2000, Bala*et.al.*, 2009, Adams 1998, Bouazza*et.al.*, 2015, Dlungwana and Rwelamila, 2016). While Ofori (2009) and Mafimidiwo and Iyagba (2015) added that, as a result of the challenges and problems affecting the development of the construction industry, there is a general perception that, the industry is lagging behind in terms of technological advancement, development of operational processes and keeping up to date with prevailing business trends. Peter *et.al.*, (2011) noted that, the literature is replete with voluminous information on factors affecting construction performance and their impact on project success.

Yan (2015) in his studies of competitive advantage of China's Small and Medium Scale Enterprises (SMEs) identified the following constraints; lack of innovation, increase in cost of production, poor management skills, outdated machines, inadequate finance and lack of research and development. While Nesan (2005) studies project finance model for small contractors in USA and concluded that, startup building contractors have limited options available from banks and other lending institutions to cover their large working capital requirement in the absence of sufficient collateral.

Smith-Jackson *et al.*, (2011) in their study of safety critical incidents among small building contractors posited that, they tend to inherit the problems that were not resolved in the earlier construction planning stages. They added that, the early work done by designers, planners and larger contractors make it difficult for small contractors to provide inputs to ensure contract obligations are more compatible with their resource constraints and capabilities. While, Hagstedt and Thideman (2013) works on the growth challenges for small building contractors in the Norway construction industry and identified two categories of growth challenges which are liquidity and problems of organization of the company.

Factors Affecting the Performance of Small-Scale Construction Firms in Developing Countries

Dlungwana*et.al.*, (2002) in their studies of small-scale construction firms operating in South Africa noted that, many problems compromise the ability of contractors in delivering projects. These are; poor work quality, low productivity, rework, late information, poor management of the design activities, inadequate or poor planning, low skills level among workers, cost over-runs, late completion, unacceptably high accident rate, insensitivity to environmental considerations, poor work practices and adversarial relationships, non-integration of the design and construction process, as well as quality management process.

Laryea (2010) studied the current challenges and opportunities facing building contractors in Ghana. The findings indicates that, significant challenges relating mainly to financing for projects and a harsh business environment. He added that, contractors had expressed frustration with the contracting environment and the politics that often surrounds it. While, Odonkor (2011) studied the determinants of business failure from the perspective of SMEs building contractors in the Ghanaian construction industry and reported that, the

suspension of projects of previous government, delay in collecting debts from new political heads, financial demands from political heads, non-payment of interest on delayed payments, assigning incompetent project leader at the site. Other problems identified includes, lack of access to capital, undervaluing of work done, change in government policies, low profit margin due to competition, delay in collecting payments, frauds/pilfering, lack of material control systems, poor monitoring and control, poor estimation practices. In addition, contracts awarded to incompetent political party members, poor tendering/selection procedure, high and unstable inflation and national slump in the economy are the most critical factors causing failures.

Furthermore, Peter *et.al*, (2011) in their studies of factors affecting the performance of small-scale contractors in Ghana surmised that, lack of performance was linked to, two main underlying issues that are, fiscal policies and management capacity. In addition, Chilipunde (2010) carried out a questionnaire survey on the constraints and challenges faced by small and medium sized building contractors in Malawi and reported that, the operational challenges facing small-scale contractors includes, lack of finance, training and business skills, limited skills in construction information technology (IT) and prevalence of unethical conduct amongst some of the stakeholders. Kulemeka *et.al*, (2015) in their studies of small and medium scale contractors in Sub-Saharan region identified the highest ranked inhibiting performance factors as; high lending interest regimes offered by financial institutions, stringent conditions to access capital, fluctuation of currency, stringent requirements for obtaining bonds, and high taxes.

While Segokgo *et.al*, (2000) noted that indigenous contractors in developing countries faces the problems and challenges of lack of financial resources, access to market and lack of plants and equipment's. Dulaimi and Tan (2001) observed that areas where significant competitive advantage can be gained to become world class, like research and development, technical expertise and financial resources, are all found lacking in local construction firms. Furthermore, Mafimidiwo and Iyagba, (2015) in their comparative studies of problems afflicting the performance of small building contractors in Nigeria and South Africa reported the following factors shown in Table 1 below:

Table 1: Factors Affecting Performance of Small Contractors

S/No	Factors Affecting Performance Small Contractors in Nigeria & South Africa
1	High interest rate from banks
2	Lack of capital equipment
3	Lack of incentive from government
4	Lack of access to funding from commercial banks
5	Inability to compete big contractors
6	Lack of employees motivation
7	Inability to develop long term strategy
8	Poor cash flow
9	Lack of reliable information about the contract
10	High labour turnover
11	Bad debt
12	Increased competition
13	Delay in payments
14	Lack of access to bonds from banks
15	Lack of confidence to small contractors by clients
16	Increased use of competitive bidding process
17	Projects abandonment's
18	Lack of safe working environment to workers
19	Focus on lowest bid
20	Lack of management skills
21	High startup cost
22	Lack of experience in book keeping
23	Low productivity
24	Pricing of construction works
25	Non co-operation from suppliers
26	Dissatisfied construction clients
27	Lack of patronage
28	Poor attitudes towards competition
29	Poor satisfaction of users
30	High level of defects in construction works
31	Poor labour relation
32	High workers absenteeism
33	Poor employees performance
34	Injuries on duty
35	Limited market size
36	Lack of professional advisers and consultants
37	Poor business location
38	High number of unskilled employees
39	Gender issues
40	Tribal/racial issues
41	High HIV and aids amongst youths

Source; Mafimidiwo and Iyangba (2015)

Raghavan and Kumar (2015) in their studies highlighted 25 similar problems afflicting small-scale contractors in India as identified by Dapaah and Musanda (2014), CIDB (2011) in their studies of small-scale construction firms in South Africa which are summarized in Table 2 below;

Table 2 Problems Affecting the Performance of Small Scale Contractors in India

S/NO	Variables Affecting Performance of Small Scale Contractors
1	Delay in payments from clients
2	Fluctuation in cost of materials
3	Owners involvement in the construction firms
4	Cash flow management problems
5	Increased competition in the construction field
6	Absenteeism of workers in construction site
7	Too much focus on low prices at tender stage
8	Lack of ability to provide safety measures to workers in the construction site
9	Lack of management skills
10	High number of employees leaving the company
11	Bad debts (payments due that cannot be collected from clients)
12	Inability to compete with medium and large scale construction firms
13	Lack of experience in the construction field
14	Inability to develop long term strategy
15	Inadequacy of working capital
16	Lack of access to updated information and technology on construction
17	Poor business location
18	High rate of interest on loans
19	Insufficient profit
20	Government policy
21	Lack of capital equipment
22	High number of unskilled employees in the company
23	Lack of professionals advisors and consultants in the construction industry
24	Banking policy
25	Lack of co-operation from material suppliers

Source; Raghavan and Kumar (2015)

While Thwala and Mvubu (2008), identified constraints limiting the success of SMCs in Swaziland which includes, lack of business management skills, lack of financial management skills, exorbitant interest rates from banks, compulsory business management services. Other factors identified as limiting success are, risks involved in construction industry, lack of access to finance both during preconstruction and construction, bad relationships with suppliers, late payments of completed work by the client. In addition, there are, lack of collateral, bidding for projects beyond contractor technical or financial capacity, lack of skills to plan projects resources in monthly segments for healthy cash flow are also imperatives. While, inability to prepare documents for timely payment, misunderstanding of terms of contract, inability to use applicable contractual instruments to demand performance by client, unethical behaviour and corrupt practices in the construction industry further limits the performance of SMCs in Swaziland.

Factors Affecting the Performance of Small Scale Construction Firms in Nigeria

Balaet.al, (2009) identified the significant problems inhibiting the growth of local construction firms in Nigeria and classified these challenges into two major categories; government related problems and firm related problems. These problems includes, unfavorable business environment, lack of enabling government policies, corruption, lack of government patronage, patronage of foreign firms, lack of vision, lack of entrepreneurial skills, limited technical expertise, shortage of plant and equipment, lack of management expertise, limited finance, shortage of manpower, inadequacy of local materials, over dependence on imports, fluctuating work load and lack of track records. These problems are very similar to those identified by Fox (2003) in Singapore and South Africa and Raghavan and Kumar (2015) in India's construction industry.

While, Ugochukwu and Onyekwena (2014) in their research on the participation of indigenous building contractors in Nigerian public sector construction projects and their challenges in managing working capital. Postulated that, the common challenges facing small-scale construction firms are; low awareness of the need for working capital management, one-man business setbacks, under-capitalization, poor funding and cash flow problems, high cost of construction finance, economic recession, reckless spending and diversion of funds, poor project planning and control. These constraints are similar to those identified in Namibia by Shifidi (2012) and Dapaah and Musanda (2014) in South Africa.

Furthermore, Kulemekaet.al, (2015), noted that other studies carried out in Nigeria revealed the following; poor contract management, financing and payment of completed works, changes in site conditions, shortages of materials, imported materials and plant items. The problems includes, design changes, subcontractors, nominated suppliers, contractor's financial difficulties, client's cash flow problem, architect's

incomplete drawings, subcontractor's slow mobilization, equipment breakdown and maintenance problems. Other challenges are suppliers' late delivery of ordered materials, incomplete structural drawings, contractors planning and scheduling problems, price escalation and subcontractor's financial difficulties. In addition, contractors face difficulties in receiving payments from public agencies, inadequate public agencies' budgets, improper payment to contractor for completed work, problems in planning, unrealistic time estimation, frequent changes in material and design, and noncompliance with the contract conditions.

Study by Adamu, *et.al*, (2015) noted that, the construction enterprise in Nigeria faces an unfavorable operating environment which includes, inappropriate regulatory framework in the industry contract documents and procurement arrangements that are unsuitable considering the technical background of contractors, nature of work undertaken, traditional ways of dispute resolution and risk allocation principle. In addition, payments to contractors and consultants on public-sector projects undertaken are very poor and delayed in the industry. While materials supply and delivery are unreliable and there is the problem of obtaining finance from banks.

Ihua and Siyanbola (2012) in their exploratory investigation of the critical challenges limiting small business performance in Nigeria revealed that six critical factors hamper the operations of small building contractors namely, limited access to credit, high cost of doing business, inadequate infrastructure, inconsistent economic policies, corruption and multiple taxes. Furthermore, Agwu and Emeti, (2014) expressed a similar view on the challenges and prospects of small and Medium Scale Enterprises (SMEs) in Port-Harcourt, Nigeria. He reported that poor financing, inadequate social infrastructures, lack of managerial skills and multiple taxation were major challenges confronting SMEs in Port-Harcourt city.

Furthermore, Fatai, (2011) examined the problems and prospects of small building contractors in Nigeria. He concludes that, the operating environment induces the challenges, which includes financial problems, government unfavorable fiscal policy, globalization effects, infrastructural facilities, financial institutions. While, others are functions of the nature and character of SMEs themselves such as, poor management practice, poor accounting standards, shortage of manpower, financial indiscipline and corruption.

This situation is of great concern to the government, citizenry, operators, research institutions, practitioners and the organized private sector groups. The governments at federal, state and local levels through budgetary allocations, policies and pronouncements have signified interest and acknowledgement of the crucial role of the SME sub-sector of the economy and hence made policies for energizing the same. There have also been fiscal incentives, grants, bilateral and multilateral agencies support and aids as well as specialized institutions all geared towards making the SMEs sub-sector vibrant. However, the problems persist and there is no improvement in the performance of construction SMEs. (Bala, *et.al*, 2009; Adams, 1998 and Bilauet, *al*, 2015).

III. Methodology

Mixed methodology involving focus group discussion and questionnaire survey considered as most appropriate was adopted for the study. Ten (10) contractors selected for the focus group discussion and pilot survey explored the problems, constraints and prospects of the small-scale construction firms. The interviews based on several questions, formulated in line with the review of past literature that was available in the domain of interest. The questions framed in an open-ended way and the responses recorded using field notes and tape recording for later transcription and analysis.

107 variables were identified during the literature review while 6 additional factors were added to the variables because of their importance as identified during the interview. The interview also helped in grouping the variables into seven (7) groups that includes company internal constraints, financial problems, environment constraints, government constraints, industry problems, resource and client related problems. The interview data was reviewed and the techniques of thematic content analysis were used to abstract the important concepts.

Questionnaire survey was used as the quantitative method developed mainly from the result of the focus group with some input from literature reviewed. Data collected from the survey was analyzed using descriptive statistics and Principal Component Analysis (PCA). Assessment of data suitability for factor analysis, extraction and rotation were carried out through Cronbach's alpha test, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for overall data set and KMO measure for each individual variable based on George and Mallery, (2010).

The population of the study comprised small-scale construction firms involved in the construction of federal government of Nigeria mass housing project within the North-west Geo-political zone, comprising seven (7) states of Kaduna, Kano, Kastina, Jigawa, Zamfara, Kebbi and Sokoto. The probability sampling method using simple random sampling technique to capture accurately the relevant data without any form of bias was found to be most appropriate for the research. Therefore the population of small-scale construction firms for each state involve in the federal government mass housing project are shown in Table 3 with their sample size based on Raghavan and Kumar, (2015) using the following sample size formula for 90% confidence level.

$$N$$

Where: The formula: $n = \frac{N}{1 + \alpha^2 N}$

n = sample size

N = size of population;

And α = alpha (0.10) by substituting the size of the population

Table 3 Showing Sample Size for each State of the Study

S/No	State	Small Scale Firms	
		Population	Sample Size
1	Kaduna	25	20
2	Kano	28	22
3	Kastina	20	17
4	Jigawa	19	16
5	Sokoto	22	18
6	Kebbi	18	15
7	Zamfara	20	17
Total		152	125

IV. Results and Discussion

Hundred and thirteen (113) factors that are limiting the performance of small-scale construction firms identified from the literature and focus group were subjected to descriptive statistics using mean and standard deviation. This helped to establish the most important factors (103) affecting performance and the result presented in Table 4. In order to determine the most critical factors affecting performance, it was decided to use a variable reduction technique to compact them into “composite factors”.

However, before applying PCA, the 103 variables were subjected to Cronbach’s alpha test to ensure that, all variables are within the appropriate category. Five (5) of the variables affecting performance were found not to be reliable and therefore deleted. This reduces the final number of variables affecting performance to 98 and the summary of the result is presented Table 5.

Table 4 Important Variables that Affect Performance

Category	Mean	Category	Mean
Company Related		Government Related	
A1-Financial indiscipline by contractors	3.42	D56-Changes in govt. policy	3.31
A2- Lack of experience & track records	3.32	D57- Lack of research & development	3.51
A3-Lack of planning & programming of works	3.27	D58- Poor economic & fiscal policy	3.20
A4-Lack of appropriate safety policy	3.29	D59-Multiple taxation of SMEs	3.53
A5-Tenders/estimates poorly done	3.09	D60- Lack of co-ordination b/w govt. agencies	3.39
A6-Lack of innovation	3.50	D61-Lack of und. of nature of constr. industry	3.06
A7- Poor supply chain management	3.31	D62-Multiplicity of regulatory agencies	3.29
A8-Inappropriate produc. technology selection	3.35	D63-poor registration & classification system	3.22
A9- Lack of vision	3.41	D64-Political influence on govt. policies	3.36
A10-Lack of competitive spirits	3.34	D65- Inflexible government attitudes	3.24
A11-Inability to develop long term strategy	3.57	D66-Dependence on foreign attitudes	3.12
A13-Lack of employees motivation schemes	3.50	D67- Lack of focused industry support meas.	3.40
A14- Lack of supervision & quality control	3.45	D68-Institutional weakness &inefficient syst.	3.33
A15- Lack of safety measures on sites	3.50	D69-Lack of political stability & peace	3.37
A16- Poor estimation practices	3.20	D70-stringent prequalification criteria	3.44
A17-Poor workmanship	3.17	D71-Inequitable contracting practices	3.43
A18-Project abandonment	3.47	D72-Bureacratc contract administration	3.44
A19-Lack of use of benching tools	3.43	D73- Budgetary problems	3.33
A20-Nonuse of construction IT	3.25	D74- Nonuse of national building code	3.41
A21-Nonuse of prefabricated & standardized pat	3.18	D75-Political patronage	3.96
A22-Materials pilfering on sites	3.30	Financial Related	
A23- Nonuse of new technology (3D printing)	3.16	B30- Lack of own funds (capital)	4.04
A24- Nonuse of sustainable Constr. Materials	3.21	B31- Inability to gets loans (collateral)	4.00
A25- Nonuse of automated constr. Equipment	3.48	B32- High interest by banks	4.13
A26-Excessive rework	3.24	B33- Stringent condn. Fr. obtain. guarantees	4.10
A27-Comporising quality over time & cost	3.39	B34-High cost of obtain. bonds/guarantees	4.08
A28- Contractors perception/attitude & culture	3.17	B35-High cost of doing business	3.85
A29- Lack of good & honest relations with clients	3.52	B36-Poor banks policy towards SMEs	3.70
Environment Related		B37-Currency fluctuation	3.83
C41- Frauds	3.41	B38-Poor cash flow	3.65
C42-Corruption	4.03	B39-Lack of advance payments	3.88
C43- Effects of globalization	3.28	B40- High inflation rates	4.03
C44-Poor infrastructures (roads, electricity etc.)	3.31	Industry Related	
C45- Lack of access to markets	3.11	E76-Fragmentation of the constr. industry	3.20
C46-High costs of transportation	3.19	E77- Contract documents biased against contr.	3.14

Critical Factors Limiting the Performance of Small-Scale Construction Firms in Nigeria

C47- Problems of importing spare parts	3.28	E78-Contr. Apportioned more risks than necc.	3.29
C48-Inclement weather	3.15	E80-Extensive use of competitive bidding	3.23
C49-Limited market size	3.10	E81- Poor communication b/w project teams	3.24
C50-Attitude & culture towards foreign goods	3.46	E82-Lack of partnering & joint ventures	3.39
C52-Tribal & racial issues	3.10	E83- Lack of performance measurement	3.39
C54-Poor image of SMEs	3.42	E84-Once up nature of construction projects	3.09
C55-High rates of SMEs	3.87	E85-Lack of efficient trade associations	3.33
Client's Related		E86-High risks nature of constr. projects	3.27
G104-Delay in payments	4.10	E87-Low projects margins in the industry	3.56
G105-Bad debts	3.64	E88-Over dependence on imports	3.03
G106-Undervaluing of work done	3.50	E89- Fluctuating work loads	3.23
G107-Too much focus on lowest bids	3.64	E90-Lack of cross industry collaboration	3.26
G108- Over complex contract conditions	3.40	E91- Disputes, conflicts & litigation	3.12
G109-Client involvement in construction phase	3.10	E92- Lack of access to credits supplies	3.77
G110-Preference given to foreign constr. Firms	3.50	Resource Related	
G111-Variations and change orders	3.25	F96-High workers turnover	3.08
G112- Inflexible aid agencies procedure	3.25	F98-Poor materials standardization	3.18
		F99-Lack of training and education	3.72
		F101-Lack of management skills	3.38
		F102-Lack of entrepreneurship skills	3.47
		F103-Lack of mentoring system	3.21

Source, field survey (2018)

Table 5 Summary of Retained Variables

Category	No. of Variables		
	Before	Deleted	After
Company Related (A)	28	1 (A26)	27
Financial Related (B)	11	-	11
Environment Related (C)	13	-	13
Government Related (D)	20	2 (D58 &D61)	18
Industry Related (E)	16	1 (E87)	15
Resource Related (F)	6	1 (F98)	5
Client Related (G)	9	-	9
Total	103	5	98

Source, field survey (2018)

After running the PCA, three different criteria suggest retaining different number of components. The Eigenvalue one criterion suggests retaining 30 components. If this solution is adopted, the retained components explaining 77.72% of the variance. The scree plot suggests retaining 12 components, thereby explaining 52.58% of the variance. While, Monte Carlo parallel analysis suggests retaining 5 components that will account for 35.35% of the variance as indicated in Table 6. When a situation like this occurs, as noted by Pallant, (2007), Costello and Osborne, (2005) deciding on the number of components to retain requires taking some additional steps. Retaining different components between the lowest to the highest suggested number should be explored and optimal solution based on the number of components that is most interpretable.

In this analysis, retaining number of components 5 and 30 was explored. The forced extraction method was used to obtain a solution based on predetermined number of components. This is in order to determine which number of components will have the most interpretable solution. The solution with 5 extracted components was adjudged to be the most interpretable in terms of the clustering of closely related variables and the result is presented in Table 7.

Table 6 Total Variance Explained: 30 Components Factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	19.481	19.878	19.878	19.481	19.878	19.878
2	5.028	5.130	25.009	5.028	5.130	25.009
3	3.734	3.810	28.819	3.734	3.810	28.819
4	3.539	3.611	32.429	3.539	3.611	32.429
5	2.860	2.918	35.348	2.860	2.918	35.348
6	2.774	2.830	38.178	2.774	2.830	38.178
7	2.638	2.692	40.869	2.638	2.692	40.869
8	2.473	2.524	43.393	2.473	2.524	43.393
9	2.450	2.501	45.894	2.450	2.501	45.894
10	2.331	2.379	48.273	2.331	2.379	48.273
11	2.137	2.181	50.453	2.137	2.181	50.453
12	2.089	2.132	52.585	2.089	2.132	52.585
13	1.850	1.887	54.473	1.850	1.887	54.473
14	1.774	1.810	56.283	1.774	1.810	56.283

Critical Factors Limiting the Performance of Small-Scale Construction Firms in Nigeria

15	1.720	1.755	58.038	1.720	1.755	58.038
16	1.612	1.645	59.684	1.612	1.645	59.684
17	1.560	1.591	61.275	1.560	1.591	61.275
18	1.463	1.493	62.768	1.463	1.493	62.768
19	1.445	1.474	64.242	1.445	1.474	64.242
20	1.384	1.413	65.655	1.384	1.413	65.655
21	1.363	1.391	67.045	1.363	1.391	67.045
22	1.308	1.335	68.380	1.308	1.335	68.380
23	1.277	1.304	69.684	1.277	1.304	69.684
24	1.233	1.258	70.941	1.233	1.258	70.941
25	1.193	1.217	72.158	1.193	1.217	72.158
26	1.163	1.187	73.345	1.163	1.187	73.345
27	1.115	1.138	74.483	1.115	1.138	74.483
28	1.087	1.109	75.592	1.087	1.109	75.592
29	1.067	1.089	76.682	1.067	1.089	76.682
30	1.017	1.038	77.720	1.017	1.038	77.720
31	.971	.990	78.710			
32	.920	.939	79.648			
33	.885	.904	80.552			
34	.866	.884	81.436			
35	.838	.855	82.291			

Extraction Method: Principal Component Analysis.

Table 7 Rotated Component Matrix^a: 5 Components Factors

S/NO	Item	Component				
		1	2	3	4	5
A2	Lack of experience & track records	623				
F102	Lack of entrepreneurship skills	621				
A14	Lack of site supervision & quality control	605				
A6	Lack of innovation	593				
D57	Lack of research and development	579				
F101	Lack of management skills	529				
D67	Lack of focused industry support measures	529				
E83	Lack of performance measurement of the industry	523				
A13	Lack of employee motivation schemes	513				
D59	Multiple taxation of SMEs	511				
F96	High workers turnover	503				
A9	Lack of vision	491				
C47	Problems of importing spare parts	483				
A17	Poor workmanship	481				
A3	Lack of planning & programming of works	480				
E81	Poor communication between project teams	452				
A21	Non-use of prefabricated & standardized parts	445				
A29	Lack of good & honest relationship with clients	415				
A15	Lack of safety measures on site	411				
C42	Corruption	410				
G104	Delay in payments		717			
B30	Lack of own funds (capital)		676			
B38	Poor cash flow		631			
B31	Inability to get bank loans due to lack of collateral		622			
B35	High cost of doing business		614			
B34	High cost of obtaining bonds/guarantees		577			
G104	Bad debts		571			
B36	Poor banks policy towards SMEs		566	426		
B32	High interest rates by banks		538			
B33	Stringent conditions for obtaining bonds/guarantees		536			
A1	Financial indiscipline by contractors		528			
B40	High inflation rates		521			
G106	Undervaluing of work done		492			
E92	Lack of access to credits supplies		488			402
B37	Currency fluctuation		483			
B39	Lack of advance payment		444	430		
G112	Inflexible aid agencies procedures			569		
C54	Poor image of SMEs			559		
D65	Inflexible government attitudes			544		
G107	Too much focus on lowest bids			539		
D68	Institutional weaknesses & inefficient systems			491		
D56	Changes in government policy			491		
A4	Lack of appropriate safety policy			423		
D63	Poorly managed registration and classification system			405		

A27	Compromising quality over time & cost			401		
D75	Political patronage				572	
C50	Attitude and culture towards foreign goods & services				551	
D70	Stringent prequalification criteria				488	
C55	High rate of SMEs mortality			402	485	
A25	Non-use of automated construction equipment's				473	
A20	Non-use of construction IT				469	
G111	Variations and change orders				467	
E88	Over dependence on imports				466	
D74	Non introduction of national building code				446	
E91	Disputes, conflicts and litigation				444	
E76	Fragmentation of the construction industry					627
E86	High risk nature of construction projects					546
E82	Lack of partnering & joint venture agreements					528
C45	Lack of access to markets					519
G110	Preference given to foreign construction firms				411	518
C46	High cost of transportation					500
E84	Once up nature of construction projects					413
C49	Limited market size					404

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

Looking at Table 7 closely revealed that, the 20 variables that load on **component 1** relates and interwoven in some ways. For instance high workers turnover (F96), lack of entrepreneurship (F102) and management skills (F101) from resource related constraints will lead to lack of site supervision and quality control (A14), lack of planning and programming of works (A3) and poor workmanship (A17) all from company internal problems. Multiple taxation of SMEs (D59) from government related constraints could lead to problems of importing spare parts (C47) as a result of associated import tariffs and lack of employee motivation schemes (A13) and provision of safety measures on sites (A15) because they require huge funding which may not available due multiple taxation.

Thus, corruption (C42) leads to lack of good and honest relationship with clients (A29) and poor workmanship (A17). While poor communication between project teams (E81) will lead to lack of focused industry support measures (D57) which lead to lack of research and development (D67) and which in turn leads to lack of innovation (A6) lack of vision (A9) and non-use of prefabricated and standardized parts (A21). In order to make an improvement in performance it is necessary to also measure current performance of the industry (E83) which if lacking could to poor workmanship (A17). Thus, component 1 is label “**Construction Firms Internal Problems**”. This confirmed postulations by Balaet.al, (2009) and Shifidi, (2012).

Table 7 indicates that, most of the variables that load on **component 2** are from the financial constraints sector (B), three variables load from client’s constraints category (G), 1 variable each from company internal constraints sector (A) and construction industry related constraints sector (E). All the variables that load on the component relates to finance including access to credit supplies (E92). This confirmed findings in earlier studies by Chilipunde (2010), Shifidi (2012) and Kulemekaet.al, (2015). Therefore, the component was labelled “**Financial Constraints**”.

As shown in Table 7 of the variables that load on **component 3**, are from the government related constraints sector (D), 2 variables from client’s constraints category (G), 2 variables from company internal constraints’ (A), while 1 variable from business environment factors (C). However, a close look at the variables revealed common strands that bind them together, for instance poorly managed or non- existence registration system (D63) makes it difficult for small-scale construction firms to registrar in any class beyond that of minor works. While inflexible government attitude (D65) towards registration requirements makes it difficult for construction firms to graduate to higher-class registration.

Institutional weaknesses and inefficient systems (D68), changes in government policy (D56) make it difficult for government agencies to formulated, implement and enforced appropriate national codes and standards, which result to lack of appropriate safety policy for the construction industry (A4). Inflexible aid agencies procedures (G112) especially the policy of 10% bid price security on submission of tender and counter fund requirement makes it difficult for SMEs to tender participate in such projects thereby worsening their already poor image (C54).

Furthermore, too much focus on lowest bids price (G107) by government and other construction client has resulted in compromising quality over cost and time (A27) and appropriate safety policy implementation on construction projects site (A4). Therefore, component 3 was labelled “**government and client constraints**”.

Table 7 indicates that, the 8 variables that load on **component 4** are from 4 categories, but there is a relationship among the variables. For instance, political patronage by government (D75), attitude and culture towards foreign goods and services (C50), stringent pre-qualification requirement (D70) will have an impact on the high rate of SMEs mortality (C55). Which will in turn have an effect on, non-use of automated construction

equipment's (A25) and non-use of construction IT (A20), since construction firms that are struggling to survive due to lack of patronage may not have funds to invest in expensive equipment's. Political patronage (D75) may also aggravate disputes, conflicts and litigation (E91), since the basis of awards was based on political considerations not competence. However it appears that, D74 is an instance of variable loading on a wrong component as highlighted by George and Mallery, (2010), Costello and Osborne, (2005), Ofori and Teo (1996). Thus, this Indicator was referred to as '**Procurement and contract conditions constraints**'.

Furthermore, Table 7 shows that, most of the variables on **component 5** are from the construction industry related constraints sector (E), and business environment sector (C). Although G110 load on component 4 but more strongly on this with loading factor of 0.518 as against 0.411 and it has strong relationship with "**construction business environment**" as component 5.

V. Conclusion

A number of in-depth focus group interviews conducted with construction industry practitioners in order to ascertain emerging problems confronting construction SMEs revealed 113 variables categorized into seven sectors that are limiting the performance and development of small-scale construction firms. The PCA helped in identifying the most critical factors, which are; construction firms internal constraints, financial problems, government and construction client related constraints, procurement and contract conditions constraints and business environment problems.

Considering the importance of the construction SMEs to GDP and problems of foreign exchange earning in a mono economy as that of Nigeria coupled with the capital flight associated with the engagement of foreign construction firms. Construction SMEs need to be supported by government and other stakeholders in order to perform effectively and to operate at par with their counterparts in other nations, that are contributing significantly towards their nation's economic fortunes as stressed by Ibrahim, (2011); Abhulimhen (2011); Arinaitwe, (2006), Mafimidowo and Iyagba, (2015).

References

- [1]. Abu Bakar A.H, AbdRazak A, Yusuf M.N and AbdKarim N. (2011), "Factors Determining
- [2]. Growth of Companies; A Study of Construction Companies in Malaysia" a paper published in the African journal of Business Management Vol.5 (22), PP.8753-8763.
- [3]. Abhulimhen, J.E. (2011), "Construction Contracting Organization in Nigeria" a paper
- [4]. Published in seminar proceedings on Strategic Construction Industry Development within National Development Goals organized by the Nigerian Institute of Quantity Surveys in Abuja, Nigeria.
- [5]. Adams, O. A., (1998), "Indigenous Contractors' Perceptions of the Importance of Topics
- [6]. for Contractor Training in Nigeria" a paper published in the journal of Habitat International, Vol.22, (2), PP137-147.
- [7]. Adamu M, Bioku, J.O and Kolawole, O. B, (2015) "Assessing the Characteristics of
- [8]. Nigerian Construction Industry in Infrastructure Development" a published in the International Journal of Engineering Research & Technology (IJERT), Vol. 4(11) P.546.
- [9]. Agwu M O and Emeti C I (2014), "Issues, Challenges and Prospects of Small and Medium Scale
- [10]. Enterprises (SMEs) in Port-Harcourt City, Nigeria", a paper published in the European journal of Sustainable Development. Vol. 3, (1), PP.101-114.
- [11]. Akintunde, I. (2003). "The Nigerian Construction Industry; Past, Present Problems and
- [12]. Prospects" a paper published in the web site of University of Ibadan in 2003, [https:// www.universityibadan.edu.ng](https://www.universityibadan.edu.ng).
- [13]. Ali I. F (2010), "The Effect of Non-financial Incentive Schemes on the Productivity of
- [14]. Artisans in the Nigerian Construction Industry" an unpublished M.sc thesis, presented to the department of building, Ahmadu Bello University Zaria in 2010.
- [15]. Aniekwu N. (1995), "The Business Environment of the Construction Industry in Nigeria" a paper
- [16]. published in the journal of Management and Economics, Vol. 13, PP.445-455.
- [17]. Arinaitwe, S. (2006). "Factors Constraining the Growth and Survival of Small-Scale Businesses;
- [18]. a Developing Countries Analysis", a paper published in the journal of American Academy of Business, Cambridge, Vol. 8(2), PP.167-178.
- [19]. Bala K, Kolo B.A and Bustani S.A. (2009), "Factors Inhibiting the Growth of Local Constructions
- [20]. Firms in Nigeria", a paper published in the proceedings of the 25th annual conference of ARCOM held in Albert Hall, Nottingham in September 2009, PP. 367-375.
- [21]. Bilau, A.A Ajagbe M.A, Bustani A.S, and Sholanke A.B, (2015), "Review of Absorptive
- [22]. Capacity in Small and Medium Sized Construction Firms in Nigeria" a paper published in the journal of Developing Countries Studies Vol.5 (16) available in www.iiste.org.
- [23]. Bouazza A.B, Ardjouman D. and Abada O. (2015), "Establishing the Factors Affecting the Growth
- [24]. of Small and Medium-sized Enterprises in Algeria" a paper published in the American International Journal of Social Science Vol.4(2).
- [25]. Chilipunde, R. L. (2010), "Constraints and Challenges Faced by Small, Medium and Micro
- [26]. Enterprise Contractors in Malawi" an unpublished PhD thesis submitted to the Faculty of Engineering, the Built Environment and Information Technology, Nelson Mandela Metropolitan University, Republic of South Africa.
- [27]. C.I.D.B, (2011), "Framework; National Contractor Development Programme" a document
- [28]. published by the Construction Industry Development/ Department of Public Works, Republic of South Africa in [http/s.www.cidb.org.za](http://s.www.cidb.org.za) in September, 2011.
- [29]. Costello, A.B. and Osborne, J.W. (2005). Best Practice in Exploratory Factor Analysis: Four

- [30]. Recommendations for Getting the Most from Your Analysis. Practical Assessment Research and Evaluation, Vol.25 (1), PP.1-9.
- [31]. Dapaah A. and Musonda I. (2014), "Perceptions of Contractor Development Programme in Some Developing Countries" a paper published in the International Journal of Emerging Technology and Advanced Engineering Vol.4, issue 10.
- [33]. Dlungwana W.S. and Rwelamila P. (2016), "Contractor Development Models that Meet the Challenges of Globalization- a Case for Developing Management Capability of Local Contractors" a paper published by Research Gate i<https://www.researchgate.net>.
- [35]. Dlungwana, W. S., Nxumalo, X. H., van Huysteen, S, Noyana, C. (2002), "Development and Implementation of the South African Construction Excellence Model (SACEM)" a paper published in the Proceedings of International Conference on Construction in the 21st Century(CITC2002), titled; Challenges and opportunities in Management and Technology, held between the 25th and 26th of April, 2002, at Miami, Florida, USA.
- [37]. Dulami F.M. and Tan F. H. (2001), "Developing World Class Construction Companies in Singapore" a paper published in the journal of Construction Management and Economics, Vol.19, PP.591–599.
- [38]. Fatai A., (2011), "Small and Medium Scale Enterprises in Nigeria"; the Problems and Prospects, a paper published in the Asian Journal of Social Sciences, Vol. 13, PP.12-23.
- [39]. Fox P.W (2003), "Construction Industry Development; Analysis and Synthesis of Contributing Factors" an unpublished PhD thesis, submitted to the School of Construction Management and Property, Faculty of Built Environment and Engineering, Queensland University of Technology.
- [42]. George, D. and Mallery, P. (2010), "SPSS for Windows Step by Step"; A simple Study Guide and Reference, 17.0 Update (Tenth edition). Boston: Allyn & Bacon.
- [43]. Hagstedt, K. and Thideman, J. (2013), "Growth Challenges for Small General Contractors in the Construction Industry" ; a Case Study of The Norwegian Building Company, an unpublished MSc thesis to the Department of Technology Management and Economics, Division of Innovation Engineering and Management , Chalmers University Of Technology.
- [44]. Ibrahim A.D, (2011), "Developing a Vibrant Construction Sector in Nigeria, Issues, Strategies and Challenges" a paper published in the proceedings of the 1st Annual Building & Construction Economic round table conference (BCERT 1), PP.88-98.
- [45]. Ihua, U. B. and Siyanbola, T. O. (2012), "Critical Challenges Limiting Small Business Performance in Nigeria; an Exploratory Investigation", a paper published in the International Journal of Business and Globalization, Vol.9 (2), PP.171-185
- [46]. Kirmani, S. (1988) "The Construction Industry in Development"; Issues and Options, World Bank Discussion Paper published by the World Bank, Washington, DC.
- [47]. Kulemeka P.J. Kululanga, G. and Morton D. (2015), "Critical Factors Inhibiting Performance of Small and Medium Scale Contractors in Sub-Saharan Region; A Case for Malawi" a paper published in the journal of Construction Engineering in <http://dx.doi.org/10.1155/2015/927614>.
- [48]. Laryea, S. (2010), "Challenges and Opportunities Facing Contractors in Ghana" a paper in the Proceedings of the West Africa Built Environment Research (WABER) Conference, 27-28 July 2010, Accra, Ghana, PP. 215-226.
- [49]. Mafimidiwo, B. and Iyagba, R. (2015), "Comparative Study of Problems Facing Small Building Contractors in Nigeria and South Africa" a paper published in the Journal of Emerging Trends in Economics and Management Sciences (JETEMS) 6(2), PP.101-109.
- [50]. N.B.S. (2015), "Nigerian Construction Sector; Summary Report; 2010-2012".
- [51]. Nesan, J. L. (2005), "Project Finance Model for Small Contractors in USA" a paper Published in the journal of the Department of Civil and Construction Engineering, College of Engineering & Applied Sciences, Western Michigan University, Michigan, USA.
- [52]. Odonkor, S. (2011), "Determinants of Business Failure; the Perspective of SMEs of Building Contractors in the Ghanaian Construction Industry" an unpublished PhD thesis presented to the Department of Building Technology, College of Architecture and Planning, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.
- [53]. Ofori, G. and Teo P. (1996), "Linking Project Procurement to Construction Industry Development: The case of Singapore. In Taylor, R.G. (Ed.). CIB W92 "North meets South" Procurement Systems Symposium Proceedings, Durban, South Africa.
- [54]. Ofori G. and Lean C.S. (2001) "Factors Influencing Development of Construction Enterprises in Singapore" a paper published in the journal of Construction Management and Economics in 2001, vol.19, PP. 145-154.
- [55]. Ofori, G. (2000), "Challenges of Construction Industries in Developing Countries; Lessons from various Countries". A paper published by ResearchGate.
- [56]. Ofori, G. (2009), "Small and Medium Sized Construction Enterprise Development", Construction for Development, (ISIZA). 1ST Quarter.
- [57]. Ogunlana S.O, Heng L. and Suklena F.A, (2003), "System Dynamic Approach to Exploring Performance Enhancement in a Construction Organization" a paper published in the journal of Construction Engineering and Management @ ASCE, PP.528-536.
- [58]. Okoye P. U, Ngwu C, Ezeokoli F.O, Ugochukwu C.S. (2016), "Imperatives of Economic Fluctuations in the Growth and Performance of Nigeria Construction Sector" a paper published in the journal of Microeconomics and Macroeconomics Vol. 4 (2) PP.46-55.
- [59]. Olayeni P.F.T and Omuh I.O. (2010), "Strategies for Improving Indigenous Contractors Participation in R&D in Nigeria" a paper published in the web sites [https:// www.covenantuniversity.edu.ng](https://www.covenantuniversity.edu.ng) in 2010.
- [60]. Osotimehin, K.O., Jegede, C. A., Akinlabi, B. H and Olajide, O.T. (2012), "An Evaluation of the Challenges and Prospects of Micro and Small Scale Enterprises Development in Nigeria" a paper published in the American International Journal of Contemporary Research Vol. 2 No. 4, P. 174.
- [61]. Pallant, J. (2007), "SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS for Windows" (Third Edition).Berkshire; Open University Press.
- [62]. Peter A. Ahadzie, Divine K. and Dansoh, A. (2011), "The Factors Affecting Construction Performance in Ghana": the Perspective of Small-Scale Building Contractors, a paper published in journal of Ghana Institute of Surveyors.
- [63]. Pekuri A, Hapasalo H, and Herrala M, (2011), "Productivity and Performance Management

- [85]. Practices in the Construction Industry” a paper published in the International Journal of Performance Measurement, vol.1, P39-48 in 2011.
- [86]. Raghavan V.S and Kumar V.K (2015), “Problems faced by Small Scale Construction Contractors
- [87]. in India” a paper published in the International Research Journal of Engineering and Technology (IRJET), Vol. 02 (02) P.105.
- [88]. Segokgo, M., Hungve, J., and Overby, C. (2000), “Citizen Contractor Development and Choice of
- [89]. Technology”, a paper published in the conference Proceedings of the 2nd International Conference of the CIB Task Group 29 on Construction in Developing Countries, 18th - 17th November, Gaborone, Botswana, P377-387.
- [90]. Shifidi I. (2012), “Small Builders in the Namibian Construction Sector; Opportunities, Challenges
- [91]. and Support Strategies” a paper published in the journal of Economic Research of Southern Africa, <https://econrsa.org/system/file/workshop/papers>.
- [92]. Smith-Jackson, T; Artis, S., Hung, Y., Kim, H. N, Hughes, C., Kleiner, B. and Nolden.A, (2011),
- [93]. “Safety Critical Incidents among Small Construction Contractors”: A Prospective Case Study, a paper published in the journal of Open Occupational Health & Safety, Vol. 3(1) P39-47.
- [94]. Thwala D. and M.Mvubu M. (2008), “Current Challenges and Problems facing Small and Medium
- [95]. Scale Contractors in Swaziland,” a paper published in the African Journal of Business Management, Vol. 2(5), PP. 93–98.
- [96]. Ugochukwu, S.C and Onyekwena, T (2014), “Participation of Indigenous Contractors in Nigerian
- [97]. Public Sector Construction Projects and their Challenges in Managing Working Capital” a paper published in the International Journal of Civil Engineering, Construction and Estate Management. Vol. 1(1) PP.1-21.
- [98]. Yan S. (2015) “A Theoretical Framework of Competitive Advantage for SMEs in China under
- [99]. New Normal Economy” a paper published in the European Scientific Journal, Vol.11, No.34, ISSN, 1857 – 7881.
- [100]. Zayed T., Elwakil E and Ammar M, (2012), “A Framework for Performance Assessment of
- [101]. Organizations in the Construction Industry” a paper published in the International Journal of Architecture, Engineering and Construction Vol.1 (4), PP. 199-212.

Ali I. F" Critical Factors Limiting the Performance of Small-Scale Construction Firms in Nigeria" International Journal of Engineering Science Invention (IJESI), Vol. 08, No. 08, 2019, PP 46-57