

**COMPETENCY OF TRADE SPECIALIST
SUBCONTRACTORS IN SOUTH-WESTERN NIGERIA**

By

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Thesis submitted in fulfillment of the requirements
for the degree of
Doctor of Philosophy

March 2016

ACKNOWLEDGEMENTS

This thesis is an expression of the learning, knowledge and ability acquired throughout my period of study at the Universiti Sains Malaysia. Therefore, to everyone that has in any capacity been influential to my improvement and who has along these lines contributed frequently without my knowing; to the ideas communicated in this thesis I owe my appreciation.

My true appreciation and gratefulness goes to my supervisors, Sr Dr. Atasya Osmadi and Associate Professor Dr. Abdul Aziz Hussin, who regardless of their tight schedule, carefully went through the manuscripts - hard and soft copies, corrected majority of the mistakes and offered constructive criticism and suggestions for the improvement of this work. The supports from the staff members of the school of Housing, Building and Planning, particularly Pn Normah and Nor Waidah, are likewise appreciated.

I sincerely thank every one of the individuals from my family: Folakemi Oluwatoyin Akanni my wife; my kids: Teniola, Eniola, Oreoluwa and Iyiola; and additionally my companions: Abidemi Ekpemena (Nee Moshood) from Nigeria, Dr. Milad Samari from Iran, Dr. Seiyd from Libya and Akram Zwain from Iraq, for their consolation and assurance help during the quest for this degree. I likewise say thanks to Dr. Alonge Richard, who encouraged my entrance into this university in 2013.

Above all, I give all the glory to God Almighty, my pillar of help and support who protected me and gave me the grace to achieve this degree of Doctor of Philosophy in Construction Resources Management at the Universiti Sains Malaysia, Penang Malaysia.

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LIST OF ABBREVIATIONS

APR	Average Performance Response
ARCON	Architect Registration Council of Nigeria
CI	Construction Industry
CORBON	Council of Registered Builders of Nigeria
COREN	Council of Registered Engineers of Nigeria
GDP	Gross Domestic Product
MNIA	Member of Nigerian Institute of Architects
MNIOB	Member Nigerian Institute of Building
MNIQS	Member Nigerian Institute of Quantity Surveyors
MNSE	Member Nigerian Society of Engineers
MR	Mean Rating
MRA	Multiple Regression Analysis
PQC	Prequalification Criteria (Independent variable 1)
PS	Performance Score
QP	Quality Performance (Dependent variable)
QSRBN	Quantity Surveyors Registration Board of Nigeria
RII	Relative Importance Index
SPSS	Statistical Package for Social Science
TA	Trust Attributes (Independent variable 3)
TR	Total Response
TSC	Tender Selection Criteria (Independent variable 2)
VIF	Variance Inflation Factor

KOMPETENSI SUBKONTRAKTOR BERKEMAHIRAN

KHUSUS DI BARAT DAYA NIGERIA

ABSTRAK

Kajian ini dijalankan untuk mengenal pasti kompetensi subkontraktor berkemahiran khusus di barat daya Nigeria. Kajian sebelum ini yang dijalankan mendapati bahawa subkontraktor berkemahiran khusus jenis ini di Nigeria kurang cekap kerana terdapat kerosakan pada kerja-kerja yang dijalankan dan ini menyumbang kepada kes keruntuhan bangunan. Objektif kajian ini adalah untuk mengenalpasti penglibatan subkontraktor berkemahiran khusus dalam pembinaan bangunan di barat daya Nigeria; untuk menilai faktor-faktor yang mempengaruhi kontraktor utama, perunding dan pelanggan pemilihan subkontraktor berkemahiran khusus, dalam pembinaan bangunan di barat daya Nigeria; untuk menentukan kecekapan subkontraktor berkemahiran khusus dalam pembinaan bangunan di barat daya Nigeria melalui kualiti prestasi; dan untuk membangunkan model konsep bagi mengenal pasti kompeten subkontraktor berkemahiran khusus di baratdaya Nigeria. Data diperoleh daripada kontraktor utama (98), perunding (89) dan pelanggan (74) dari enam negeri barat daya Nigeria melalu borang soal selidik dan dianalisis dengan menggunakan statistik deskriptif dan inferensi. Dapatan kajian menunjukkan bahawa subkontraktor mahir, kebanyakannya terlibat dengan kerja-kerja struktur (50%) dan pertukangan (60%) dan dalam menyediakan pekerja-pekerja, bahan, loji dan peralatan (Min = 3.48) semasa melaksanakan kerja mereka. Faktor-faktor yang paling tinggi dilihat dapat mempengaruhi pemilihan subkontraktor mahir adalah: sewaktu di pra-kelayakan; keupayaan untuk mematuhi arahan yang berkualiti (RII = 0,84; R = 1), tender; mengemukakan tender bonafide dengan senarai item yang

minimum (RII = 0.93; R = 1) dan sifat amanah; mempunyai kelayakan dan pekerja berpengalaman (RII = 0.79; R = 1). Kajian ini juga menunjukkan tahap kecekapan subkontraktor mahir, dalam penggunaan bahan-bahan (APS = 2.64), mutu kerja (APS = 2.50), metodologi pembinaan (APS = 2.19), pemahaman teknikal (APS = 3.06), dan pengalaman teknikal (APS = 2.57). Berdasarkan semua purata skor prestasi yang dihitung dari purata penarafan responden (APR = 2.61), sub-kontraktor mahir adalah rata-rata kompeten dalam pembinaan bangunan di barat daya Nigeria. Hasil model mendedahkan bahawa taraf mutu kerja, integriti, sumber yang mencukupi, program kerja dan operasi adalah peramal yang signifikan dalam menentukan kecekapan subkontraktor mahir dalam pembinaan bangunan dan persamaan model konsep analisis regresi berganda adalah $Y = \alpha + 0.940X_1 + 0.540X_2 + 0.428X_3 + 0.393X_4 + 0.288X_5 + \epsilon$.

COMPETENCY OF TRADE SPECIALIST SUBCONTRACTORS IN SOUTH-WESTERN NIGERIA

ABSTRACT

The study was conducted to identify competency of trade specialist subcontractors in south-western Nigeria. Previous studies conducted within Nigerian found that this trade specialist subcontractors are incompetent because works executed by them are faulty and had contributed to the various cases of building collapse. The objectives of the study were therefore: to identify trade specialist subcontractors involvements in building construction in south-western Nigeria; to examine factors influencing main contractors, consultants and clients in the selection of trade specialist subcontractors in south-western Nigeria; to determine competence of trade specialist subcontractors in the south-western Nigeria through quality performance; and to develop conceptual model for identifying competent trade specialist subcontractor in south-western Nigeria. Data were sourced from the main contractors (98), consultants (89) and clients (74) in the six states of the south-western Nigeria through questionnaire administration and analyzed using descriptive and inferential statistics. The findings of the study revealed that the trade specialist subcontractors are involved in the structural works (50%) and carpentry (60%) and in the provision of the workmen, materials, plants and equipment (Mean = 3.48) during execution of work aspect. The highest factors perceived to be influencing the selection of trade specialist subcontractors among prequalification criteria is ability to comply with quality instructions (RII = 0.84; R = 1); tender criteria: submit bonafide tenders with minimal tagged items (RII = 0.93; R = 1) and trust attribute: has qualified and experienced workers (RII = 0.79; R = 1). The study also revealed that trade specialist subcontractors

are competent in the use of materials (APS = 2.64), workmanship (APS = 2.50), construction methodology (APS = 2.19), technical understanding (APS = 3.06), and technical experience (APS = 2.57). Based on the average performance score computed (APR = 2.61), trade specialist subcontractors are averagely competent in building construction in the south-western Nigeria. The result of the conceptualized model revealed that standard of workmanship, integrity, adequate resources, work programme and operation are significant to identify competent trade specialist subcontractors and the multiple regression equation generated is: $Y = \alpha + 0.940X_1 + 0.540X_2 + 0.428X_3 + 0.393X_4 + 0.288X_5 + \varepsilon$.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

According to Ayangade et al. (2009), the construction industry, everywhere in the world cuts over all aspects of human activities and has been seen to be the life wire of economic development of a nation - *Nigerian construction industry is not an exception to this*. The industry involves of a number of heterogeneous and fragmented firms, and within the organization, there are a number of construction activities going on (Ameh & Odusami, 2010; Fagbenle, 2005). The industry is project-based and as such the organization engages in projects ranging from building to civil engineering works (Akanni et al., 2015).

Aibinu and Odeyinka (2006) described the industry as the one sort of special commercial enterprises than the others that stands out among the most dangerous and unsafe working environment. Palalani (2000) also portrayed the construction industry as one of the fundamental requirement for development in any economy because it provides the infrastructure needed to different areas of the economy to thrive, engages in the provision of housing as the essential human need, instrumental in the provision of facilities for communications network and also provides significant employment opportunities at both high and low levels.

Furthermore, the construction industry has also been viewed as a division of the economy which transfers assets into economic resources, social infrastructure, facilities and a significant source of direct employment and income (Dada, 2011; Fagbenle, 2005) and according to Idoro (2012), the industry comprised of construction companies, materials and equipment suppliers as well as consultancies

firms with individuals that worked as construction professionals, developers, planners, main contractors, subcontractors, material and component producers, tradesmen and unskilled construction workers, financiers and insurers.

Ofori and Debrah (1998) and Ofori (2002), view the industry from economic dimension and argued that the construction industry is a fundamental sector, as it cut across other sectors and transform materials and monetary resources into constructed physical facilities which are necessary for social and economic development while Chia et al. (2012) argued that the industry also contributes through the whole range of construction operations and projects, to the growth and development of virtually all other economic sectors.

While all the aforementioned authors are right in their description of the construction industry, however, this study will summarize the description of the industry thus; the construction industry all over the world may be considered as the sector of the economic system, which through its activities such as: design, planning, construction, maintenance and repair, transforms various resources into physical facilities. The facilities produced by the industry ranges from corporate and residential buildings to heavy construction such as roads and bridges, and that these physical facilities are important in the process of the nation's development.

Mostly, the participants of the construction industry include the professionals such as: architects; builders; engineers; quantity surveyors; contractors: main and subcontractors, construction workers, clients such as: developers; corporate organizations; and individuals who are operators and users of the facilities. Financial and insurance firms, real estate valuers and materials and equipment leasing companies and materials producers, among others, are likewise participants in the

construction industry although these groups of participants are generally regarded as ancillary to the building industry. Government at various levels also participate in the industry as regulator, purchaser, arbitrators and financiers. In addition, the construction industry plays vital role as it contributes fundamentally to the realization of national objectives, for example, in satisfying an extensive variety of physical, money related, and societal needs. The players in the industry are individuals such as builders, quantity surveyors, architects, engineers, estate surveyors & valuers, main contractors and subcontractors, suppliers, artisans and labourers which often assembled into temporary groups. (Adenuga & Dosumu, 2012; Idoro, 2012; Oladirin et al., 2013).

In the history of development economics in Nigeria, the construction industry has been thought of as a key factor as the industry emerged as a dominant feature of the nation's economic development as a result of high activity level in the sector occasioned by the post-civil war reconstruction and the oil boom which simulated execution of various private and public projects between 1971 and 1975 (Akanni et al., 2015). Buttressing this view, World Bank (1994), reported that the contribution of the construction industry in Nigeria in the 1980s, were up to 7% of the Gross Domestic Product (GDP) which is an indication that the industry has been playing important and significant role in the national development of the country. Notwithstanding the contribution of the industry to the GDP of the nation, it also significantly employed and provides job opportunities for millions of construction labourers, artisans and tradesmen workforce in most countries (Ogunlana & Chang, 1998; Ogunlana et al., 1996; Olomolaiye et al., 1987). Ayangade et al. (2009) however, noted that the construction industries of many nations that are developed

are in charge of around 22% of their country's GDP, while the Nigerian case is somewhat below 16% contribution to its economy.

National Bureau of Statistics (2015) reported that construction contribution to GDP in Nigeria has been dwindled and that it presently stands at 4.5% which is as a result of the combination of low performances, low demands and productivities over the years. Mbamali and Okotie (2003) were of the opinion that the issue of the construction industry's contribution to GDP in Nigeria may have been as a result of the low utilization of mechanized system within the industry and its high reliance of the economy on the oil sector. Ayangade et al. (2009), attributed this claim to the relatively higher employment of about twenty percent (20%) expected to be provided by the industry for about one hundred and forty million people in Nigeria (as at 2009) in comparison with about twelve (12%) employments that needed to be provided by the developed nations. Obadan (2001), asserted that in the developing countries such as Nigeria, the construction industry has the capacity to employ up-to a half of the labour force.

Ogunsanmi (2013), however, observed that there had been a downturn in the Nigerian economy since 1985 and the downturn created recession in the construction industry. The result of the downturn according to Fagbenle (2011) made the clients, both private and corporate think of less expensive project execution systems which could reduce cost, time and without compromising the qualities, to accomplish constructions. Thus, Fagbenle and Adeosun (2012); Ogunsanmi (2013) and Oladirin et al. (2013) found that among the different methods of project execution systems such as traditional contracting, design and build, project management, management contracting, subcontracting and direct labour systems which have been in use in the

Nigerian construction industry, the system favoured by the clients was subcontracting.

Subcontracting according to (Mbachu, 2008) is a system of project execution whereby the client deals directly with the main contractor and the main contractor in turn contracts out some or all the portions of the work to small companies or individual contractors called subcontractors and according to Hoban and Francis (2010), subcontractors are well experience in different aspects of construction work and are mostly engaged by the main contractor to handle such specific aspect of a project in the general contract.

According to Eom et al. (2008), subcontracting has been a long-standing practice in the construction industry worldwide and common because of uncertainties in construction demand. Loh and Ofori (2000) noted that the construction industry in many of the countries relies heavily on subcontracting and Fagbenle (2011) credited the purpose behind this dependence to be a reaction to the exceptional feature of the construction development which includes the nature of the items contracted, instabilities and discontinuities in workload and additionally the huge number of interrelated undertakings which changes from one stage to another.

The subcontracting system involves the employment of subcontractors by the main contractor (or general contractor) to perform a specific trade aspect of the construction project and the subcontractors normally receives payment for the services provided from the general contractor. Studies such as: (Hinze & Tracey, 1994; Kale & Arditi, 2001; Kumaraswamy & Matthews, 2000) cited in Mbachu (2008) therefore identified three types of subcontractors in the construction industry and they are: *trade specialist subcontractors* - is a person or a company that

specializes in certain trades or areas of expertise of construction work as a result of knowledge and training in a specific field of construction such as brick/blockwork, concrete work, carpentry work, painting; *services subcontractors* - those that handle services in a building for example mechanical and electrical services, and plumbing works; and the *labour-only subcontractors* - the skilled tradesmen that are only available for labour services while the main contractor supplies the materials and attendance.

1.2 Problem statement

The rate of occurrences of building failure and collapses in Nigeria is worrisome; the frequency of occurrences speaks volume about the image of the construction industry; the news of such incidents are reported in the country by both the print and electronic media from time to time (Okon, 23 August, 2014). Between 2011 and 2012 alone, most major cities in Nigeria witnessed three to four building collapse as reported by Okon (23 August, 2014).

Some examples of cases of building collapse as reported by: Adeniran (2013); Ayedun et al. (2011); Oni (2010) and Windapo and Rotimi (2012) were those occurred in Lagos: Ketu; Surulere; Ikeja; Maryland and recently reported Synagogue Church building Ikotun, Lagos (Okon, 23 August, 2014), Abuja: Mararaba Gwarimpa estate; Jabi junction, Garki Area and Pape. There were other cases of building collapse at Owerri in the south-eastern part of Nigeria where three collapses were recorded within a period of one month. Cities such as Sokoto in the north-western part, Ibadan in the south-western part and Yenagoa in the south-southern part of Nigeria also witnessed building collapse incidents (Okon, 23 August, 2014).

In each of these collapses, lives were lost and injuries sustained while the nation suffered huge economic losses.

Many researchers within Nigeria such as: (Ayedun et al., 2011; Dimuna, 2010; Ede, 2013; Fagbenle & Oluwunmi, 2010; Fakere et al., 2012; Olagunju et al., 2013; Oloyede et al., 2010; Opara, 2007; Windapo & Rotimi 2012) had traced the menace of this building collapse among many others, to the use of incompetent subcontractors while Windapo and Rotimi (2012), reported that in most cases, the building collapse in Nigeria has been attributed to the overall performance of both main contractors and subcontractors at all the stages of construction projects. Table 1.1 shows reported cases of building collapse in Nigeria.

However, Adeniran (2013); Ayedun et al. (2011); Ede (2013); Oloyede et al. (2010); Oni (2010) and Windapo and Rotimi (2012) identified incompetent subcontractors, faulted and poor workmanship, faulty construction methodology, and lack of technical understanding as the most recipes for the incessant building failure.

The few researches conducted which are related to issues about subcontractors within Nigeria were: Fagbenle (2005) which was an appraisal of the performance of labour-only subcontractors in the construction industry in southwestern Nigeria; and Ogunsanmi (2000) which was a comparative study of the performance of traditional and labour-only procurements. However, none of these aforementioned studies considered competency and were not conducted directly on the trade specialist subcontractors.

Table 1.1 Reported cases of building collapse in Nigeria from 1974–2010 (period of 25 years)

S/№	Building location	Type of building structure	Date of collapse	Suspected causes of building collapse	Casualty
1	Mokola, Ibadan	Multi-storey building under construction	October 1974	Excessive loading	27
2	Banawa Housing Estate, Kaduna	Residential building	August 1977	Faulty design	28
3	Markafi, Kaduna	School building	July 1977	Carelessness	7
4	Western Avenue, Lagos	Three-storey building	December 1978	Undisclosed	Unknown
5	Banawa Housing Estate, Kaduna	Three-storey residential building	1980	Faulty structural design	6
6	Allen Avenue, Ikeja Lagos	Residential storey building	January 1985	Excessive loading	Nil
7	Adeniji Adele, Lagos	Residential building	February 1985	Excessive loading	2
8	Iponri, Lagos	Uncompleted four-storey residential building	May 1985	Excessive loading/Carelessness	13
9	Ojuelegba Road, Lagos	Two-storey residential building	May 1985	Rainstorm/nature	Nil
10	Bereku Lane, Lagos island	Three-storey residential building under construction	July 1985	Excessive loading	9
11	Gboko, Benue State	Residential building	September 1985	Carelessness	1
12	Anambra State Trade Fair Complex	A central pavilion of a shopping complex	September 1985	Undecided	Unknown
13	Allen Avenue, Ikeja Lagos	One-storey residential building	1985	Carelessness	Nil
14	Adeniji Adele, Lagos	Residential building	1985	Carelessness	2
15	Osogbo, Osun state	Mosque	May 1986	Faulty design/carelessness	2
16	Beere, Ibadan	A bungalow	June 1986	Undecided	Unknown
17	Ona street, Unugu Anambra state	Residential two-storey building	1986	No investigation	2
18	Ihiala, Imo state	High Court building	1986	Collapse ceiling	2
19	Agege, Lagos	Two-storey building under construction	May 1987	Carelessness	2
20	Idumagbo lane, Lagos	Two-storey residential building	September 1987	Ignorant Client/No Structural Design	17
21	Ikorodu road, lagos	Commercial building	September 1987	Rainstorm (nature)	4
22	Akinade Village, Ikeja Lagos	A storey building	September 1987	Undecided	Unknown
23	Calabar, Cross river state	Residential building	October 1987	Rainstorm (nature)	3
24	Kano	Residential building	1988	Undecided	Unknown
25	Benin City, Edo state	One-storey Hotel Building	July 1989	Undecided	None
26	Akinwumi street, Mende village, Lagos	Six-storey Hotel Complex	October 1989	Faulty Design	Unknown
27	Igbobi, Lagos	Uncompleted Three-storey Residential Building	October 1989	Undecided	None
28	Idumota, Lagos	Three-storey Commercial Building	February 1990	Undecided	Unknown
29	Obasiolu, Diobu Port-Harcourt	Three-storey school Building	June 1990	Ignorant Owner/No Structural Design	55
30	Alagbado, Ogun state	School building	October 1990	Undecided	None
31	Area 10, Abuja	One-storey Multi-purpose indoor Sports complex	March 1993	Structural Failure/Poor workmanship	Unknown
32	Karu, Abuja	NICON-NOGA Staff Housing project	March 1993	Structural failure/poor supervision	Unknown
33	Abeokuta, Ogun state	A Mosque under construction	1995	Structural failure/poor supervision	2
34	Maryland, Ikorodu road, Lagos	Six-storey Building	Jan 1995	Undecided	Unknown
35	Bankole Street, Apongbon, Lagos Island	Two-storey Building under Construction	May 1995	Undecided	Unknown

36	Central Lagos	Storey Building under construction	October 1995	Poor workmanship /structural failure	10
37	Mosadoluwa Close, Ogba Lagos	Three-storey Church Building	October 1995	Faulty Design/Carelessness	15
38	Alagbado Area, Ibadan, Oyo State	School Building	October 1995	Poor Workmanship	Nil
39	Oke Igbala Area, Ibadan, Oyo State	Three Storey Building	October 1995	Structural Failure	6
40	Lagos State	Storey Building under construction	March 1996	Structural Failure	Injuries only
41	Olowookere Street, Oshodi, Lagos	Church Building (CAC)	May 1996	Conversion/Structural Weakness	7
42	Ijagbemi Street, Pedro Lagos	Six storey Classroom Building under construction	October 1996	Use of quacks and structural failure	1
43	Adedayo Adeniran St., Amukoko Lagos	Residential Building	March 1997	Undecided	None
44	Amu Street, Mushin Lagos	Two-storey Commercial Building	June 1997	Use of poor materials and structural failure	None
45	Enugu, Enugu State	Three-storey Building under construction	June 1997	Undisclosed	Unknown
46	Ilorin, Kwara State	Mud Building	September 1997	Undisclosed	Unknown
47	Mba Street, Ajegunle, Lagos	Magistrate Court Building	January 1998	subcontractor incompetency	Unknown
48	Gwarimpa Area, FCT, Abuja	Duplex Building	1998	Structural Failure	2
49	Ibadan, Oyo State	Three Storey Residential Building	1998	Faulty Design/Poor Supervision	Several peoples
50	Akure, Ondo State	Four Storey Church Building under construction	October 1998	Structural Failure/Poor Supervision	8
51	Fumbi street, Abeokuta, Ogun State	Two Storey Residential Building	November 1998	Substandard materials/structural failure	None
52	Cole Street, Ojuelegba Lagos	Two-storey Building	April 1999	Carelessness/use of poor building materials	4
53	Charity Road, Oko-Oba, Agege, Lagos	Three-storey Building	June 1999	Structural failure	None
54	Tokunbo Street, off Adeniji Adele Rd., Lagos	Three-storey Building	June 1999	Undisclosed	Unknown
55	Nigerian Air force, Aero medical Centre, Kaduna	One-storey Hospital Building	August 1999	subcontractor incompetency	Unknown
56	Fagbemide Lane, Akure Ondo	One-storey Building	September 1999	Undisclosed	Unknown
57	Four Square Gospel Church, Maitama, Abuja	Three-storey Church Building	October 1999	Faulty design/implementation	Not available
58	Obawole Estate, Iju Agege, Lagos	One-storey Residential Building	October 1999	Structural failure	None
59	Salisu Street, Iju-Isahaga, Lagos	Three-storey Church Building under Construction	October 1999	Structural Fault/Rainstorm	35
60	Dawodu Street, Ifo, Ogun State	Two Storey Residential Building	October 1999	Rainstorm	20
61	Adeola Odeku Str, Victoria Island, Lagos	One-storey Building	1999	Rainstorm	Unknown
62	Idi-Oro Mushin, Lagos	Residential Building	2000	Faulty Design /Carelessness	Unknown
63	Eleganza Estate, Ajah, Lagos	Three-storey residential Building	April 2000	Incompetence of subcontractor	5
64	21, Buhari Street, Mushin, Lagos	Two Storey mosque Building	April 2000	Unauthorized conversion of a bungalow into a two Storey Building	7
65	Iwoye-Ijesa, Osun State	One Storey Residential Building under construction	2001	Structural failure/incompetence	7
66	Port Harcourt, Rivers State	Two-storey School Building	2003	Dilapidated Structure	Unknown
67	10, Elas Street, Lagos	Two floors residential Building	2004	subcontractor incompetency	Unknown
68	22, Makinde Street, Ebute-Metta, Lagos	Three floors building	2004	Undisclosed	Unknown
69	11, Solola Street, Agege, Lagos	Two floors Building	2004	Undisclosed	Unknown

70	40, Market Street, Shomolu, Lagos	Two floors commercial Building	March 2005	subcontractor incompetency	Unknown
71	Ibile Holding, Ikeja, Lagos	Three Floors Framed Commercial Building	April 2005	Undisclosed	Unknown
72	Port Harcourt, Rivers State	Commercial Building	June 2005	Undisclosed	Unknown
73	6, Princess Street, Lagos	Three Floors Commercial Building	July 2005	Undisclosed	1
74	Mushin, Lagos	Four Floors Commercial Building	2005	Undisclosed	1
75	53, Cemetery Road, Amukoko, Lagos	Four Floors Residential /Commercial Building	January 2006	Ignorance/Greedy Landlord	7
76	Ikpoba-Okha, Local Govt, Edo State	Two Floors School Building	April 2006	Undisclosed	2
77	Abuja	Three Floors Office building and Churches	June 2006	Undisclosed	None
78	Ebute-Metta, Lagos	Multi-storey commercial /residential building	2007	Unauthorized conversion, poor supervision, use of poor quality building materials	Several people
79	Kano	Formwork failed during construction	2007	subcontractor incompetency	Several people
80	Olomi Area, Ibadan, Oyo State	Building used as nursery/primary school	March 2008	Use of poor materials/carelessness	13
81	Ogudu, Ojota, Lagos	Three-storey Building under construction	April 2008	subcontractor incompetency	Unknown
82	Wuse Area, Abuja	Five-storey Shopping Complex Building under construction	August 2008	Structural Failure /subcontractor incompetency/Bad workmanship	2 & 100 trapped
83	Asero Area, Abeokuta Ogun State	Two-storey Residential Building under construction	August 2008	use of substandard materials and subcontractor incompetency	2
84	Ogbomoso, Oyo State	Six-storey LAUTECH Teaching Hospital Complex under construction	February 2009	Use of substandard materials, poor workmanship/subcontractor incompetency	5
85	Aghaji crescent, GRA, Enugu	A Fence Wall	August 2009	No proper drainage	1
86	Oke Padre Street, Ita-morin, Abeokuta	Uncompleted Building	October 2009	Use of substandard materials faulty construction methodology	3, 11 injured
87	Isopakodowo street, Cairo, Oshodi, Lagos	Building under construction (for Lagos State Govt)	April 2010	Use of substandard building materials	4, 12 injured
88	Adenike Street, Off New Market, Oniru Estate, Lagos	Uncompleted Storey Building	June 2010	Use of substandard building materials, noncompliance with approved building plans and weak structure	1, 2 injured
89	2, Okolie street, off Gimbiya street, Abuja	Uncompleted 4-Storey Building	August 2010	Substandard materials and wrong construction methods	23, 11 injured
90	Ikole street, Area 11, Abuja	Formwork failed during construction	August 2010	subcontractor incompetency	5 & 40 trapped
91	24, Alli Street, Victoria Island, Lagos	Four-storey Building	September 2010	Structural Defects/overloading	3

Source: Windapo and Rotimi (2012)

Besides, other studies within Nigeria, such as: (Ayedun et al., 2011; Ojo, 2009; Oloyede et al., 2010; Oni, 2010) which investigated tackling causes of frequent building failure in Nigeria; and the client's needs for building projects and incidences of collapsed buildings in Lagos Metropolis only identified mainly structural failure, formwork failure, concrete failure and the involvement of the incompetent subcontractors in the building collapse cases. These studies did not investigate the trade specialist subcontractors who normally handle the acclaimed aspect of construction works that failed most such as masonry work, carpentry work (formwork), structural (steel reinforcement) and none of the studies suggested solution to identify competent subcontractors to be employed especially the trade specialist subcontractors.

In spite of these findings, which identifies incompetent subcontractors as one of the recipe for building collapse in Nigeria and the acknowledgment of the crucial effect of the subcontractors' work on the project success generally, there is no research conducted to verify the issues of competency of trade specialist subcontractor - *research gap has been created*; no literature is concentrated directly on the trade specialist subcontractors - *literature gap has been created*; and there is no specific framework in Nigeria which could aid clients, main contractors and consultants in the selection of competent trade specialist subcontractors - *this also create gap in the practice*. The frequent occurrences of building collapse which had been linked with the work done by the use of incompetent subcontractors among many other factors, by the researchers within Nigeria needs more than minor recognizable proof as both life and huge amount of monetary assets are lost all the while.

This study, therefore, intends to fill the gap by verifying the competency of trade specialist subcontractors in south-western Nigeria; provides literature on criteria that

could be useful in the process of identifying competent trade specialist subcontractors and develop conceptual model that could be useful to the main contractors, clients and consultants in the determination of competent trade specialist subcontractors.

1.3 Research questions

Studies in the past (Doloi, 2009; Hoban & Francis, 2010; Kale & Arditi, 2001; Loh & Ofori, 2000; Mbachu, 2008) has confirmed the prevalence of the employment of subcontractors generally in the building industry, and as indicated by Fagbenle (2011), it is extremely common for the main contractors to utilize trade specialist subcontractors for most aspect of the construction works. Studies conducted within Nigeria (Adenuga & Dosumu, 2012; Aje, 2012; Ogunsanmi, 2012; Opara, 2007) subscribed to this claim, however, other studies also from Nigeria (Ayedun et al., 2011; Ede, 2013; Oloyede et al., 2010; Oni, 2010) found that many of these subcontractors, particularly those with specialized trades (trade specialist subcontractors), were not competent as they are faulted with the use of substandard construction materials, poor workmanship, faulty construction methodology, lack of expert understanding, etc.

According to their school of thought, the incompetence of these trade specialist subcontractors have been contributed to some of the building collapse that had occurred at the various locations in the country (Ayedun et al., 2011; Oloyede et al., 2010; Oni, 2010). The danger of building collapse in Nigeria has then become a source of concern and embarrassment and since some of the occurrence has been traced to the use of incompetent subcontractors, then one need to ask numbers of

pertinent questions around the competencies of the trade specialist subcontractors that are engaged for construction projects in the south-western Nigeria.

The questions are:

1. How the trade specialist subcontractors get involved in the construction projects in the south-western Nigeria?
2. What are the criteria influencing the main contractors, clients, and consultants in their selection and to ensure competence?
3. What is the extent of trade specialist subcontractor's competence in building construction in the south-western Nigeria?
4. What are the factors determining the trade specialist subcontractor's competence in the south-western Nigeria?

1.4 Research objectives

The research is aimed at assessing trade specialist subcontractor's competence in building construction in the south-western Nigeria via the following objectives:

1. To identify trade specialist subcontractors involvements in building construction in south-western Nigeria;
2. To examine factors influencing main contractors, consultants and clients in the selection of trade specialist subcontractors in south-western Nigeria;
3. To determine competence of trade specialist subcontractors in south-western Nigeria through quality performance; and
4. To develop conceptual model for identifying competent trade specialist subcontractor in south-western Nigeria.

1.5 Scope of the study

The research focuses on the assessment of trade specialist subcontractor's competence in building construction in the south-western Nigeria. Previous studies (Abbasianjahromi et al., 2013; Arslan et al., 2008; Doloi et al., 2011; El-Mashaleh, 2009; Mbachu, 2008) on assessment such as: qualifications; eligibilities; and selections of subcontractors had been generally based on prequalification and tender criteria. Although, these criteria were used generally without making mention of any categories of subcontractors, however, they are found useful in this present study because part of the research also investigate the prequalification and tender criteria perceived to be influencing decisions during the selection of trade specialist subcontractors before the expected competence are measured at the construction stage of project execution. The present study therefore, adapted some criteria from the general prequalification and tender criteria for subcontractors generally which had been used in the past studies and this current research added two other criteria: trust attributes to be considered during the selection process and quality performance criteria to be considered during the practical construction stage for the assessment of trade specialist subcontractor's competence in building construction in the south-western Nigeria.

Thus the trade specialist subcontractor's competence in building construction is conceptualized with four items, namely; prequalification (Aje, 2012; Doloi, 2009; El-Sawalhi et al., 2007; Mbachu, 2008; Ng et al., 2003), tender (Abbasianjahromi et al., 2013; Eriksson et al., 2007; Hartmann et al., 2009; Mbachu, 2008), quality performance (Arditi & Chotibhongs, 2005; Hartmann et al., 2009; Loh & Ofori, 2000; Xiao & Proverbs, 2002b) and trust (Chow et al., 2012; Egan, 1998; Khalfan et al., 2007; Latham, 1994; McDermott et al., 2005; Pinto et al., 2009; Romahn &

Hartman, 1999). Three of the variables (prequalification, tender and trust attributes will be assessed in terms of their relationships with the subcontractor's competence and how well these variables predict the competence of a trade specialist subcontractor.

Nigeria is all around embraced with immense human and material assets that promises supportable financial development and improvement. The landed area of the country is about 923,773km² with population hovering around one hundred and seventy-eight million (as at 2014) people according to National Bureau of Statistics (2015) having different types of cultural backgrounds. There are about two hundred and fifty (250) ethnic groups in the nation and this adds a dynamic mix to the social, political and cultural diversity to the country. Nigeria is currently running a federal system of government with thirty-six (36) states which are divided into six geo-political zone, a Federal Capital Territory, and seven hundred and seventy-four (774) local government areas.

The study covers six states of the south-western geo-political zone of Nigeria, the six states are; Ekiti, Lagos, Ogun, Ondo, Osun and Oyo as shown in Figure 1.3.



Figure 1.1: Map showing the thirty-six states of Nigeria
Source: www.mapsofworld.com/nigeria/

The south-western region of Nigeria offers an extensive variety of sights and encounters; from the shorelines in Lagos to the regular springs in Osun state and from the noteworthy city of Ibadan to Olumo rocks in Abeokuta the capital of Ogun state. It is majorly a Yoruba speaking territory, although there are distinctive tongues within the same state. The climate conditions fluctuate between the two unmistakable seasons in Nigeria; the raining season which spans between March and November of the same year and the dry season which spans between November and February of the following year. During the dry season in Nigeria, there is usually harmattan dust; cool, dry winds from the northern region which blows into the southern region.

The south-western region was selected as the study area because about 60% percent of the construction activities in Nigeria takes place in this region (Okon, 23 August, 2014; Olaleye, 2008); the head offices of the majority of the main contractors, trade specialist subcontractors and consultancies firms in Nigeria are located and operating in this region (Okon, 23 August, 2014; Olaleye, 2008) and most of building collapses reported in which incompetent subcontractors were find to have contributed occurred in this region (Adeniran, 2013; Ayedun et al., 2011; Olagunju et al., 2013; Oloyede et al., 2010; Oni, 2010)

The study covers government and private clients, main contractors and trade specialist subcontractors that registered with either the State Tender Board or Ministry of Works and Housing and consultants who registered with Consultancy Board in each of the six southwestern states (Ekiti, Lagos, Ogun, Ondo, Osun and Oyo) of Nigeria. In line with this, the expected respondents were classified into groups (the main contractors, clients and consultants) and the questionnaires were administered on each group using simple random method. The investigation was concentrated on the aspect of involvement, criteria influencing decision during selection, extent of competence and criteria determining the competence of the trade specialist subcontractors using their quality performance in the construction process.

The trade specialist subcontractors were limited to the structural, concrete, masonry and carpentry works only and they were those who registered as subcontractors for the aforementioned trades with their various state Ministry of works and Housing. The decision to focus on these trade specialists in preference to others lays on the predominance of the use of concrete, steel reinforcements and bricks/blocks as the major construction materials, and also the extensive use of planks for both roof

members and formwork during the construction operations in Nigeria. Moreover, a good number of the reported instances of building collapse were as a result of incompetent subcontractors, failure of steel reinforcement and formwork during the construction operations (Ayedun et al., 2011; Oloyede et al., 2010; Windapo & Rotimi, 2012).

The study is also limited to quantitative method in a survey approach and questionnaires instrument in the collection of data from the respondents. The method of data analysis were limited to the use of Statistical Package for Social Science (SPSS)

1.6 Significance of the study

Previous studies acknowledge labour intensiveness of construction works, as well as being craft-based activity and that the quality of the product has an enormous influence upon the image of its industry. As noted by Fagbenle (2011), the main contractors are regularly involved in the mechanisms that changes in-puts: labour; capital; and materials, into out-puts that is; physical facilities, however, they cannot work in isolation in the long run. They work along with subcontractors, materials sellers, equipment merchants and related financial establishments among different firms. Subsequently, the capability of main contractors to deliver construction project effectively dependent to a large extent on the capabilities of their subcontractors.

The significance of the study are as follows: in terms of academic significance, studies focusing on the competence of trade specialist whose work aspect were the collapse reported in many cases are very rare hence this study will identify competence of trade specialist subcontractors; literature seldom concentrated on the

competence of trade specialist subcontractors in building construction especially in the Nigerian construction industry hence the gap created in the literature will be partially filled; and framework that could aid clients and main contractors in the selection of competent trade specialist subcontractors in Nigeria seldom exist hence the study intend to come out with a framework.

Practically, the study will provides useful information that could aid the clients and main contractor in the selection of competent trade specialist subcontractors through the identified criteria, it will as well be part of measures to achieve quality construction end products and also to curtail the threat of building collapse in Nigeria.

1.7 Thesis organization

This thesis contains six chapters, chapter one consists of the background of the study, statement of problem, research questions, and objectives of the study, scope of the study, significance of the study, definition of terms as well as the organization of the thesis.

Chapter two: this chapter contains the review of related literature centered on the trade specialist subcontractors in the Nigeria construction industry, rationale of using subcontractors generally and criteria for the selection of trade specialist subcontractors that centered around competence and as well the conceptualization of the trade specialist subcontractor's competence.

Chapter three: the chapter contains the research methodology and described; the research design, population and sampling process, questionnaire design, data collection techniques and methods used in analyzing the data.

Chapter four: the chapter contains the analysis of the data; the interpretations of results, validity and reliability of the data. The chapter also presented the summary of the research findings and results of the hypotheses tested towards the end.

Chapter five: discussions of the results and findings in this current study are contained in this chapter. In addition, the present findings were contrasted and compared with the results of the past study.

Chapter six: the conclusion of the study is contained in this chapter, it enumerates the main findings and contributions to the theory and the practice in the construction industry especially in Nigeria and suggestions for future studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examined the literature identifying with the study on trade specialist subcontractors competence in building construction. The chapter begins with general development of subcontractors in the construction industry and classification of subcontractors. Next, the chapter presents trade specialist subcontractor relationship with the main contractor which was followed by methods of sourcing for the employment of trade specialist subcontractors and the general significance of trade specialist subcontractors in building construction.

Next, the chapter considered selection of trade specialist subcontractors from a ground theory of resource-based view and was followed by the process of selecting trade specialist subcontractors for construction works particularly using prequalification criteria, tender criteria and trust attributes. Furthermore, the chapter presents the conceptualization of trade specialist subcontractors' competence and followed by the trade specialist subcontractor quality performance. In conclusion, the chapter proposed conceptual framework followed by the development of the hypotheses and finally the summary of the chapter is presented.

However, it is noted that there were existing literature related to the issues of subcontractors in the Nigeria construction industry (Fagbenle, 2011; Fagbenle and Adeosun, 2012) and outside the world (Abbasianjahromi et al., 2013; El-Mashaleh, 2009; Mbachu, 2008; and Ulubeyli et al., 2010) which are dated, nevertheless, this current study will add to the worth and significance of essential information needed

and gives a foundation and notable premise from which competence of trade specialist subcontractors can be identified.

2.2 General development of subcontractors in the construction industry

The advent of subcontracting in the building trades dated back to the eighteenth century, when there was emerging of Master Builders in London (Arditi & Chotibhongs, 2005; Bennett & Ferry, 1990; Borg, 1995; Reiner, 1972). The master bricklayers according to Dainty et al. (2001) and Greenwood (2001) were acting as master builders by drawing a plan and estimating for building works. Later, there emerged the general builder whose job was to work on contracts. They then started arranging with individual craftsmen by subcontracting parts of the construction works to them (Bennett & Ferry, 1990; Reiner, 1972). These individual skilled workers as indicated by Reiner (1972) and Gray and Flanagan (1989) were later addressed as subcontractor which turned into a term used to depict a foreman and his team, whose relationships depend on the relative-focused patriarchal arrangement of the general public.

According to Debrah and Ofori (1997), the history of the development of work subcontracting in Singapore began when the Chinese foreigners came around the middle of nineteenth century. They became apprentices and later learn skills from master tradesmen and later organized themselves into groups which are led by a multi-skilled leader called foremen.

On the Nigerian scene, Adams (1997) and Fagbenle (2005) reported that the intervention of the British rule introduced the extensive use of wages and salaries for the participants of the building process, migration from rural to urban area and the

resultant dispersal of close family unit formerly used for construction purpose. As a result of this development, Adams (1997) and Fagbenle (2005) reported that a new form of housing construction had to emerge and in it, the client negotiated directly with the contractors and the contractor provides the materials and entered into a direct contractual relationship with the subcontractors for the execution of the portion (s) of the works.

2.2.1 Classification of the subcontractors

According to Hinze and Tracey (1994), Kale and Arditi (2001), Kumaraswamy and Matthews (2000), and Lee (1997), subcontractors can be classified into three main categories in the construction sector. They are: trade specialist subcontractors; services subcontractors; and labour-only subcontractors and according to Adams (1997), Ogunsanmi (2000) and Fagbenle (2005), a typical subcontractor in Nigeria falls into one of the categories identified.

i. Trade Specialist Subcontractors

According to Bennett and Ferry (1990), Mason (2007), Ng et al. (2003) and Fagbenle and Adeosun (2012), trade specialist subcontractors generally provides trade services or practice on particular trades such as: masonry, concrete, carpentry, structural (bending and arrangements) – a significant number of which are general contractors that utilizes subcontracting as an intends to get work amid times of competition yet can and frequently want to fill in as main contractors. Gray and Flanagan (1989) and Lee (1997) elaborate on the description of trade specialist subcontractors as they are of the opinion that they are those carrying out works that does not require a high level of technical expertise, mainly in the core construction trades such as panting, masonry, carpentry, concreting, plumbing etc. furthermore, Gray and Flanagan

(1989) and Lee (1997) described the trade specialist subcontractors as typically those with little business, managerial and financial skills in the industry and are usually domestic or selected and the type of work awarded to them depends on; the availability of work and the main contractor's workload; whether the main contractor has the skills and labour available to carry out the work; and the possibility of lower overheads, higher margins or better cash flows arising from passing on the responsibility of subcontracted works out to another party.

In the context of the this study therefore, trade specialist subcontractors are those that offer general trade services or specialize on specific trades such as carpentry, flooring, iron-bending and brickwork – many of which are general contractors that use subcontracting as a means to get work during periods of tough competition. However, in their mode of engagement, they can be *domestic subcontractor* - subcontractors selected singularly by the main contractor to carry out work packages or *nominated subcontractors* - clients participate in the nomination, selection and also approves the successful subcontractor who will then entered into a subcontract with the main contractor in order to perform the specialist trade role (Harris and McCaffer, 2013; Morledge and Smith, 2013).

ii. *Services Subcontractors*

According to Hinze and Tracey (1994), Lee (1997) and Mbachu (2008) they are those that handle services in a building for example mechanical and electrical services, and plumbing works;

iii. *Labour-only Subcontractors*

According to Fagbenle (2005), Gray and Flanagan (1989) and Lee (1997), labour-only subcontractors are the skilled tradesmen that are only available for labour