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Brief Philosophy of the Journal

This Journal aims to publish original research and provide a forum for critical conceptual and analytical debate which extend the bounds of knowledge in and about business and organisational functionality in Africa. This does not preclude consideration of papers from other parts of the world. This journal will typically have the following content: Editorial, Peer-reviewed papers and cases, practitioner view-pointpapers and book reviews.

Submissions

Papers should be submitted by email and online. in accordance with the 'Notes to Contributors'.

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Editorial

We are happy to publish Volume 28 issue 2 of the *African Journal of Management Research*. In this issue, we publish nine quality articles.

The articles cover Female Farmers and Climate Change, Traditional Medicine Services, International Accounting Standards and Foreign Direct Investment, Application of Survival Model to Analyse Loan Default, Determinants of Consumer Attachment to Third Places, Supply Chain Management in Hotel Chains, Users' Trust and Satisfaction on E-Commerce Services, Effective Employee Training in the Public Sector in

Tanzania and Quality Analysis of Some Characteristics of Cement.

Clearly, the papers cover a broad range of interesting topics.

The authors of these papers are based in Tanzania, Nigeria and Ghana. Together, this edition too makes for interesting reading. Varied methodologies are adopted in these investigations to the benefit of the reader.

I wish you happy reading and please stay tuned for more interesting research finding in subsequent volumes and issues.

Editorial Policy and Information for Authors

Focus of the Journal

African Journal of Management Research seeks to publish works that test, advance and develop models, frameworks and concepts in the broad areas of management, organisation, finance, public sector management, marketing and decision systems. The Journal is international and multidisciplinary, which means that topics and themes appropriate for African Journal of Management Research will come from and cut across organisational/institutional sectors (public, private, non-for-profit) and address matters of theory, research and practice from a variety of management and organizational disciplines (finance. operations, human resource, organisational behaviour, marketing, services). The Journal's multidisciplinary character means it seeks to promote the interplay nexus between organisational functionality, management practice and economic / national development. The Journal's aim is to facilitate greater understanding organisational of processes, managerial processes and critical firm level functions and challenges facing developing and emerging areas.

Papers will have strong theoretical foundations solid and defensible methodological frameworks with clear empirical stance. In this regard, African Journal of Management Research mainly empiricist. Our definition of 'empiricist' in this context is not to exclude the phenomenological. Rather those papers will have sound quantitative and/or qualitative data, rigorous design and demonstration of exploring and advancing knowledge of the world 'as-is'. The Journal will periodically accept prescriptive,

theoretical and conceptual papers (the world-as-should-be) which in its view present sufficiently ground-breaking discourse of theory, models and methodological paradigms, reviews of the literature or practice which lead to new understandings.

Structure of the Journal

The Journal is published in a 2-part Volume each year: January and June. It has the following typical structure:

- Topical Editorial: Written by the Editorial Board, the Editor or his nominee
- Articles/Invited papers
- Solicited and unsolicited papers that have come through the review process
- Practitioners' view point: Written by a practitioner or an academic, but with a clear practice slant
- Peer reviewed teaching case,
- Book Review

Submission Guidelines

The Journal's circulation is worldwide. It pursues a policy of double-blind peer-review. Papers are likely to vary in length from 5000-7500 words. Papers outside this range may only be considered under special circumstances.

Papers are invited from the general academic, research and practitioner community in Africa and around the world; the journal will occasionally issue calls for papers along particular thematic lines or request peer commentaries on topical issues.

Authors must submit an electronic copy of their manuscript (in MS Word) to the Editor via email.

Notes to Contributors

Authors are to note that should the Editor deem it necessary, the Journal may call for file/analyses and/or research instruments for separate or simultaneous review. It is a condition of acceptance for review, that the paper is not under consideration elsewhere and that the data are not being repeated from a previous work (except that clear and demonstrable alternate issues, concepts or extensions are being developed, in which case due reference and notification must be made to said previous work). The Journal has an internet Editor. The following are the key submission requirements:

- There must be an Abstract of up to 250 words. Manuscripts must be prepared with MS Word and in Times New Roman font size 12. 1 inch margins must be maintained all round, fully justified and in double line spacing. The Abstract and References must be in single line spacing and font size 10.
- Title Page (title, author's name/s, institutional affiliation, full contact details phone, fax, email and post) must be prepared separate from the body of the paper. Titles must be as concise as possible and not more than 15 words. Authors must a void any reference to themselves no matter how tangential in the body of the text.
- Avoid the use of foot or end notes.
- Tables, Figures and Diagrams must be camera ready and sharp, set within the text; numbered, titled at the bottom without spacing from table, figure or diagram, all in font size 10. Voluminous descriptive data tables are not encouraged, except that they have direct bearing on the discourse and need to be referred to. Parsimony in use of tables and figures is preferred.
- All articles should include in the

- methodology, clear statement of where and when data were collected. The use of student populations where the matter at hand does not relate to student issues is not encouraged.
- Formulae must be presented using appropriate font and symbols, and set to centre, font size 10.
- It is the responsibility of authors to secure the necessary copyright permissions if reproducing illustrations and diagrams or using extensive ditto quotes reaching to 100 words or more at any one quote.
- African Journal of Management Research requires that authors note that copyright is vested in the Journal.
- It is generally preferred that authors should ensure they articulate the nature of their paper's contribution to theory, method, policy or practice.

Manuscripts must be prepared according to the following format:

- Title of the paper should be in **Title**Case, Bold and centred
- No paragraph numbering,
- Follow APA referencing style in the body of the text and in the reference listing.
- Examples of referencing in body of text:
 - ♦ In sentence: Aryeetey (2001);
 - End sentence: (Hinson, Domfeh and Ayee, 1999);
 - If a work has more than 2 authors, cite all in the first instance and use 'et al' subsequently;

Reference list should use the following style:

- Journal articles: Puplampu, B. (2004). Meaning of Work, Journal of Behaviour, 2, 3, 111-120.
- Books: Puplampu, B. (2004).
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Headings must follow the house style:

FIRST HEADING (Bold, UPPER CASE, 1 space from text, font size 12, centred) Secondary Heading (Bold, Title Case, not spaced from text, font size 12, left justified) Tertiary Heading (Italicised, Title Case, not spaced from text, font size 12, left justified)

Review Process

We detail below, the typical process for all papers received.

Upon receipt of any manuscript, the Editor will make an initial determination as to compliance with editorial policy and submission requirements. Papers found to be compliant will receive an entry number and the Editor will then write to the corresponding author acknowledging receipt and quoting an entry number. The Editorial Board will then send the paper to at least 2 reviewers. Authors whose papers are not found to be initially compliant may be asked to resubmit a revised version or informed of an outright rejection by email such papers will not receive an entry number.

African Journal of Management Research maintains a 2-3-month turnaround time from submission to decision. The secretariat will keep authors informed by email, of the progress of their paper/s.

Reviewers are expected to apply the strictest codes of scientific professionalism to the process and are to turn papers round within 8-10 weeks and

are not expected to use or quote from any manuscripts they review.

Authors will receive a notification of the Editor's decision with any necessary comments from reviewers. Where the manuscript is accepted subject to amendments suggested by reviewers, authors are to turn such revisions around within reasonable time of not more than 2 months. Authors are to pay particular attention to typographical errors, print errors, grammatical aberrations, complete-ness of references etc as such lapses tend to delay the reviewprocess.

Accepted papers will be published in order of receipt of final versions. Final versions must be submitted in both MS Word and PDF format. Authors whose papers are accepted will receive 1 complimentary copy of the journal issue in which their paper appears.

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Ghanaian Rural Female Farmers and Climate Change: An Exploratory Qualitative Case Study

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Abstract:

Climate change poses a major threat to development in most low and middle-income countries, especially the sub - Saharan Africa. Wurompo is a small farming community in the Wenchi Municipality of the Brong-Ahafo region of Ghana that depends on rainfed agriculture activities for livelihood. In recent years, droughts, unpredictable rainfall pattern and crop failure have become common in the area. The study assessed knowledge and awareness, effects of climate change on female farmers, and their adaptation strategies. An exploratory case study in design, qualitative methods were used to collect data from 50 purposefully selected participants. Data were analyzed using themes and sub-themes generated from the research questions. Findings showed lack of adequate information and knowledge on climate change and its effects. Climate change has impacted negatively on these farmers stemming from decline in crop production and unavailability of adequate water supply in due season. Challenges to climate change adaptation are poverty, poor infrastructure, and modern farming practices. Farmers must be educated on climate change and its effects, with training on the necessary adaptation strategies to build their resilience. Policies that target rural farmers to adapt to climate change, and device modern agricultural techniques and practices are also necessary.

Key words: Climate-change, farmers, female, Ghana, rural

Introduction

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as a statistically significant variation in either the mean state of the climate or in its variability or both, persisting for an extended period (typically decades or longer). Thus, climate change is explained as a long-term shift in the climatic patterns of a specific place or region measured by changes in the behavior of climatic elements such

as temperature, wind patterns and precipitations resulting in changes in ecosystems and socio-economic activities (Urama & Ozor, 2010). Such changes according to these authors, bring about uncertainties in agricultural activities as well.

Though the fact is established that climate change is one of the main environmental problems of the 21st century, most climate change stakeholders are still concerned political about the contestations, complexities and misgivings surrounding the phenomenon (Aylett, 2013.; Mueller et al., 2014; Ryan, 2015). Despite the lack of consensus among climate stakeholders, authorities in the field have made it clear that intensity and frequency of extreme climate variabilities resulting in floods, cyclone, droughts, and the like are destined to rise with small mean increases in temperature (Meehl et al., 2007; Marks, 2011). The IPCC predicted the effects of these changes on humanity to be enormous and unavoidable (IPCC, 2014; Mikulewicz & Taylor, 2020). Also, Current Global Circulations Models (CGM) inability to forecast empirically, the specific levels of shifts in the planetary system, makes climate change and its impacts on humanity more worrying. Necessary and urgent steps are therefore needed to restrict these impacts for the attainment of balanced and sustained development to include poverty reduction (IPCC, 2014).

Research has revealed that many vulnerable groups are battling with the impacts of climate change, and a lot more are yet to witness more threatening occurrences in the ensuing years (Codjoe & Atiglo, 2020; IPCC, 2014). The IPCC sums up the problem in its 2014 report for policy makers as "Climate change will amplify existing risks and create new risks for

natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development" (page 1). Climate variability policy research therefore expect that with the limited adaptive capacity, low and middle-income countries especially, Sub-Saharan Africa would be unduly affected (IPCC, 2014). Researchers argue that Sub-Saharan Africa's high susceptibility to the impacts of climate change is based on several determinants - biophysical, socioeconomic, and political (IPCC, 2014; Connolly-Boutin & Smit, 2016). They additionally predict beyond variabilities in temperature precipitation, and experience of intense events like floods, droughts, and storms in Sub-Saharan Africa with their attendant problems on all facets of life (Raleigh et al., 2015; Dosio et al., 2015).

Areas south of the Sahara are likely to emerge as the most vulnerable to climate change with likely agricultural losses ranging from 2% to 7% (IPCC, 2014). Also, crop yield in Africa would fall by 10% to 29% by 2050 or even up to 50% as a result of climate variabilities (Jones & Thornton 2015). These have serious implications for Sub-Saharan Africa considering the World Bank's projections that demand for food in this same region will double by 2030.

The agricultural sector is the backbone of the economies of most low and middle-income countries engaging about 60% of the work force and contributing close to 30% of gross domestic product (GDP) on the average in sub-Saharan Africa (World Bank, 2011). Smallholder farmers form the majority in the agricultural sector and are therefore the backbone of agricultural production in Africa (Dixon *et al.*, 2004). These smallholder farmers have in their

access for agricultural production, a mean of two or less hectors of land and number about 36 million across the continent (Jaeger, 2010; Nagayets, 2005). Due to their dominance in the sector, they make a huge and important contribution to the domestic production of food and produce crops for export that earn foreign exchange for these economies. With reliable and consistent climatic conditions, the contributions of smallholder farmers could lead to economic stability of agriculture-dependent countries in Africa.

Ghana, like all other countries in Sub-Saharan Africa, is equally vulnerable to the impacts of Climate Change (IPCC, 2014; 2018). Climate change in Ghana is evidenced by extreme weather events and high unpredictability in weather patterns, thus, impacting on people's source of livelihoods. In the last 45 years, recorded temperatures in the country rose about 1°C while rainfall and runoff decreased by approximately percent, 20 and 30 respectively (Ghana Meteorological Agency). Agriculture grants the largest share of Ghana's Gross Domestic Product (GDP), ranging between 35.8% and 37%. It generates about 30-40% of the country's foreign exchange earnings and employs about 55% of the work force. It is predominantly practiced on smallholder, family operated farms using rudimentary

technology (IPCC, 2014; 2018). Hence, the effect of climate variabilities on this sector and individuals involved cannot be overemphasized. The distribution of rainfall is the single most important factor affecting agriculture in the country. As a nation that depends mainly on rain-fed agriculture, Ghana is extremely vulnerable to climate variability and change.

Evidence abounds in climate change

literature that farmers are aware that the climate has changed, and this change has negatively affected their output (Enete & Thornton, 2011). The unfortunate aspect of the climate change dilemma in Ghana is that most of the farmers do not understand or appreciate their contributions to climate change devastations. This is more so among rural farmers, especially females, who still engage in traditional forms of slash and burn systems of farming (Agwu, 2011). It is well acknowledged that rural women in particular play a key role in environmental and natural resource management and therefore not out of place to focus on them in a study related to climate change. There is, therefore, a clear need to investigate and learn from local climate change understandings of rural female farmers, to fill knowledge gaps, and to improve information exchange to facilitate decision-making and successful climate change adaptation strategies. It is, therefore, important to find out how farmers, who are major environmental stakeholders, perceive the issue of climate change, the type of changes they have observed in the past and how they have coped with the changes. This study was therefore conducted to unravel the level of climate change awareness, effects of climate change, and adaptation strategies among rural female farmers in Wurompo, a farming community in the Wenchi District of the Brong-Ahafo Region of Ghana.

Materials and Methods

Study Design, Area, and Participants

An exploratory case study design was employed to study the effects of climate change on rural female farmers, assess their knowledge and awareness about climate change, as well as the adaptation strategies used by these women to cope with the

effects of climate change on their livelihood. The exploratory case study design was used because it offers a holistic form of inquiry (Creswell & Creswell, 2017). This design granted the opportunity for an in-depth assessment and analysis of each of the objectives of the study with a view not to generalize the findings, but to unveil what specifically pertains to women farmers at Wurompo in the Brong-Ahafo Ghana, regarding Region of experiences with climate variabilities over the years, in the context of limited empirical literature.

Study Context

The study was conducted at Wurompo, a small community that is located few kilometres from the Wenchi Municipality in the Western part of the Brong-Ahafo Region of Ghana in. Wurompo is situated at the north-eastern part of Sunyani Municipality. The area is covered by moist-

deciduous forest and the Guinea Savana Woodland vegetation zone Statistical Service, 2013). The rainfall pattern is seasonal, which is a limiting factor in agriculture and plant growth. The average annual rainfall is about 1140 -1270 mm with an average temperature of 30.9 degrees Celsius and a minimum of 21.2 degrees Celsius. The temperature of Wurompo community is generally high, averaging about 24.5 degrees Celsius, with the month of February being the hottest month, (Ghana Statistical Service, 2013). Wurompo is predominantly a farming community, and the main crops cultivated by the people are maize, yam, cassava, cowpea, with very few of them cultivating sorghum. The farmers intercrop maize, cassava, and yam, and few people in the valleys cultivate pepper, garden eggs and other vegetables. The distribution of rainfall is the single most important factor affecting agriculture in this and other parts of Ghana.

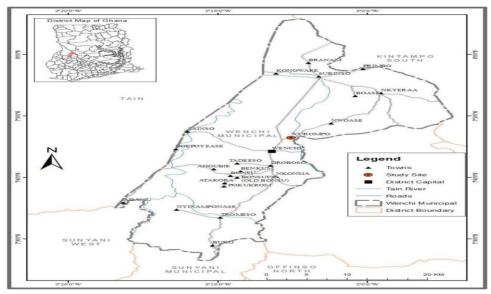


Figure 1. Map showing the study location

Study Population, Sampling and Sample size

Women in the Wurompo community formed the target population for the study because they are predominantly farmers and rural dwellers who have little or no formal education and are therefore relatively disadvantaged in terms of economic power. Thus, the effects of climate change may impact on them greatly. Purposive sampling technique was used to select women who were farmers in wurompo, have lived and farmed in the community for not less than five years, and were willing to participate in the study. These women were in the position to narrate their experiences with climate variabilities and their coping strategies over the years. Forty-six (46) of such women were recruited for the study. Twelve (12) of the women who had lived in the community and practiced smallholder farming activities for over 15 years were engaged in in-depth interviews whilst the remaining 34 eligible women were put in groups of 11 or 12 for focus group discussion (FGD). The participants were identified with assistance from the community leaders. Four (4) officials from the Ministry of Food and Agriculture and Ghana Meteorological Agency in the Wenchi Municipality were also selected purposively for additional information on the subject matter. A total of 50 participants took part in the study.

Data Collection Methods and Instruments

In-depth interview sessions were organized with 15 women who had experience with smallholder farming activities in the study community for over fifteen years to find out their knowledge on climate change, its effects on their farming activities and on their livelihood, and how they have adapted to climate variabilities over the years. These interviews were organized individually at

their convenience in the community. Additionally, the remaining 35 participants were put in 3 groups for focus group discussion. The FDGs were organized in the community to solicit spontaneous responses on the nature of climate variability occurrences in the knowledge, and awareness on climate change issues, how climate change has affected their normal farming practices and their livelihoods, and how they have coped with these changes. Key informants' interviews were also conducted with 4 officials from the Ministry of Agriculture and Ghana Meteorological Agency for their views on climate change impacts and adaptation in the area.

The data collection instruments consisted of in-depth interview guide, key-informants interview guide and FDG guide. These were developed by the first three authors with the research questions as guide. Data collection was led by the last author who hails from the study region and was assisted by two qualitative research experts with the requisite qualification and experience in qualitative data collection and management. All the data collectors are Master of Philosophy holders with Social Science background and are very proficient in the local Bono and Akan dialects which are the main languages in the study region. Data collection lasted for a month.

Data Management and Analysis

All interviews and FDG discussions were recorded electronically, and manual field notes were also taken. The two qualitative research experts independently translated and transcribed verbatim all the recorded interviews and discussions verbatim into English in a word processing application and added on the manual notes taken during data collection. They then came together to review the transcripts and the

original recordings and built consensus where there were disagreements. The transcripts and notes were stored as files that were coded manually for textual analysis guided by the principles of grounded theory (Mack, 2005). During the coding, blocks of text were placed into nodes using themes and sub-themes. Information from the themes were compared for similar and opposing views across the transcripts on knowledge and awareness on climate change and its effects on rural women. Quotes were then selected (verbatim and enhanced slightly to improve readability) to exemplify the themes.

Ethical Consideration

Before the start of the study, ethical approval was obtained from the Ethics Committee of Humanities, University of Ghana with the study protocol. All participants were provided with written informed consent before they agreed to participate in the study. Following information and explanation on rationale, purpose, procedures, confidentiality, participation and rights, risks, and benefits, voluntary, and right to withdrawal at any point without prejudice to participants, participants were given the opportunity choose between signing or thumb- printing the written consent form before their involvement in the study. Permission was also sought participants to take photos and to publish the findings of the study with anonymous quotes and masked faces to make them unidentifiable. This was done by asking participants to also sign or thumbprint another portion on the written informed consent form.

Results

The findings of the study were presented under the broad themes of demographic characteristics of participants, knowledge and awareness on climate change, effects of climate change, and adaptation strategies.

Demographic characteristics of participants

The majority (69.5%) of the female farmers involved in the study were between the ages of 31 and 50 years, 13% were between 21 and 30 years, 8.7% were 51 to 60 years, and the remaining 8.7% were 61 years or more. About 54% of participants had primary or secondary education, and 46% had no formal education. Whilst about 35% were single (widowed or divorced), remaining 65% were married. Most participants were traditional/non-religious-57%, 39% were Christians and 4% were Muslim. About 46% of the women had 5 to 20 years-experience with farming, 50% had farmed for 21 to 40 years, and only 2 (3.3%) had over 41 years- experience with farming (Table 1).

The 4 officials from the Ministry of Food and Agriculture and the Ghana Meteorological Agency involved in the study were all males. Their ages ranged from 36 years to 54 years, three of them were married, they all had tertiary education, and they had all worked in the Wenchi Municipality for more than 2 years.

ATTRIBUTE	FREQUENCY	PERCENTAGE
Age (Years)		
21 - 30	6.0	13.0
31 - 40	14.0	30.4
41 - 50	18.0.	39.1
51 - 60	4.0	8.7
61+	4.0	8.7
Educational Level		
No Formal Education	21.0	45.7
Primary	16.0	34.8
Secondary	9.0	19.5
Tertiary	0.0	0.0
Marital Status		
Never Married Before	0.0	0.0
Married	30.0	65.2
Divorced	5.0	10.9
Widowed	11.0	23.9
Religious Affiliation		
Christian	18.0	39.1
Muslim	2.0	4.3
Traditional/Non-Religious	26.0	56.5
Years of Farming		
5 – 10	10.0	21.7
11 - 20	11.0	23.9
21 - 30	17.0	37.0
31 - 40	6.0	13.0
41+	2.0	3.3

Table 1. Socio-Demographic Characteristics of Female-Farmer Participant

Knowledge and awareness on climate change

All the female-farmer respondents were aware of changes in climatic conditions of the area. This was mainly based on their observations in changes in temperature and rainfall patterns over the years. Knowledge on climate change and its impact was, however, poor. Participants demonstrated scanty knowledge on climate change based on their experiences with the phenomenon and linked it with rising temperature and unpredictable rainfall patterns.

Regarding sources of information on climate change, the majority indicated no information from external sources. Only a few had shallow information from few school children with limited information from local FM stations. Thus:

"The seasons nowadays, keep on changing, it used to rain in due season, but now, it even rains in the dry season. Temperatures also continue to be higher than we used to experience. These tell me that something is really happening with the weather and climate around us."

-(Participant, in-depth interview)

"The climate is changed in this area because there are increases in temperature over long periods of time than usual, and now we cannot differentiate between rainy and dry seasons properly, it rains anyhow during the year unexpectedly."

-(Participant, FGD1)

"I do not have any idea about weather changes, except that I have observed some changes. Normally, I plant my crops in the third month of the year, but it is not so now, the rainfall pattern has changed, and unstable now. Last two years, the rains started in the fourth month, but it was a different show all together last year. It started in the second month and stopped at the end of the third month and never came back until the sixth month when all our crops were destroyed."

-(Participant, FGD1)

"......It's my grandson who told me that he's learned from school that the climate around us keeps changing and we'll be experiencing worse conditions regarding temperature increases with less rainfall. As to why these changes, he was unable tell."

-(Participant, in-depth interview)

The reasons given for the observed changes in climatic conditions ranged from 'not knowing exactly', to superstition.

".....this is a difficult question, hmm, I'm not God so I cannot explain the reasons why rains are not falling as they should, and temperatures are high. However, I think that our sins are so much that God cannot bear it any longer and

has decided to punish us with heat and scanty rainfall."

-(Participant, in-depth interview)

"I am of the view that God sometimes ceases rain from falling on our crops simply because of our evil deeds. The other day I heard that a man killed his wife in the bush, and another killed a young girl for money, why won't God be annoyed when all these evil things are going on? I am saying this because, sometimes, it stops raining right after we have sown our crops."

-(Participant, FDG2)

Participants of FGD3 attributed low crop production mostly to poor soil fertility and the fact that they do not own land in the community. Most of the female farmers were of the view that landowners normally rent poor infertile land to them, which cannot support proper agricultural activities.

"Because we are strangers here, landowners give us portions of land that are not good. These cannot support proper agricultural activities, so we continue to remain poor because of constant low crop yield."

-(Participant, FDG3)

"I know the rains are not falling, but the problem is, we do not have good farmlands, that is the more reason why we are not getting enough food. Though I agree that sometimes the earth gets very hot, however, if we own good and enough farmlands, we will be able to produce more food."

-(Participant, FGD3)

Effects of Climate Change on Female Farmers

The unpredictable rainfall pattern, coupled with high temperatures, according to the study participants, that have had some effects on their lives include poor yield, droughts, soil erosion on farmlands, wilting of crops, low and poor water resources, and failure to plant/cultivate in due season (see Figures 2, 3 and 4)

These have consequently impacted on their economic lives and their very existence as humans, and is witnessed as: increased poverty levels, threatened food security, increased workload of female farmers such as walking long distances in search for water, poor school performance among their daughters, migration of the men/husbands to cities in search for greener pastures, leading to increased burden of care of children on the women alone.



Figure 2. Women and children fetching water from the stream and dried-up borehole Source: Fieldwork



Figure 3. Destroyed pepper farm due to erosion.

The female farmers noted that the unstable nature of rainfall sometimes led some people not to plant crops at all in some seasons.

.....Last year, for instance, most of us waited for the rains in vain, so we could not plant anything for the manor season farming. -(Participant, FDG2)



Figure 4: Poor crop yield due to low rainfall

Adaptation Strategies of Female **Farmers**

Participants established that they were engaging in various activities to offset some of the effects of climate change on their lives. These include:

Planting of drought resistant and early maturing crops: A significant number of participants, especially the elderly, mostly plant drought resistant and early maturing crops like cassava, sorghum, cowpea, groundnut, beans, among others. The Dagaabas group mostly cultivate sorghum and groundnuts.

Multi-cropping/mixed farming and inter-cropping:

"I grow maize and cassava on one farm, l own cowpea farm, which is ready for harvesting, and l just finished harvesting my sorghum. The reason behind this is if some crops fail others will not. Cowpea is a good crop for some of us to plant because it matures very fast, so when it rains late, l don't cultivate any crop again apart from the cowpea and groundnuts"

-(Participant, FGD2)

Participants also declared that they engage in other social intervention activities such as:

Working on people's farms exchange for food or money: which is popularly known among study participants as 'by day.'

".....at times I have to go and assist my friend on her farm for some small amount of money or food so I can cater to some extent for my family." -(Participant, in-depth interview)

Unsustainable adaptation strategies



Figure 5: Female farmers harvesting drought-resistant and early maturing crop. Source: Field work

Migrating to other places in search of job:

Participants however, declared that though these serve to relieve them of poverty to some extent, they are not sustainable.

Other maladaptation activities

Interviews with Municipal officials revealed that farmers in the area are engaged in

cutting down trees and selling of firewood, applying inorganic fertilizers to increase soil nutrient which in turn influence climate change. They also practice slash and burn method of farming with negative influence on the environment and consequential effects on the climate, as well as farming in valleys and along nearby riverbanks resulting in dry up and pollution of rivers.



Figure 6. Tree marked to be destroyed by DDT or brine and women carrying firewood to sell at dawn

Source: Field work



Figure 7. Slash and burn farming and polluted river due to nearby farming activity Source: Fieldwork

Discussion

The reality of climate change cannot be overemphasized, and in Ghana, the increasing variability of rainfall patterns increases the risk associated with farming as prediction becomes almost impossible. Current projections on climate indicate that rising temperatures and frequent droughts will increase the incidence of bush fires and environmental degradation (IPCC, 2014). Farmers in the northern part of Ghana complain of reduction in farm output arising from the uncertainty of rainfall patterns, and increased erosion resulting from heavy downpour, which consequently destroys soil fertility (Aid, 2008). Smallholder farmers are most vulnerable to climate change (Disai & Zhang, 2021), since their margin of security is narrower. Their reliance on rain makes them more dependent on the very climate that has shifted and continues to shift. With less education access to and limited infrastructure and communication as the

study has revealed, there are limited ways affect everyone equally. The poorest in the for farmers to understand the nature of the changes.

Some empirical evidence exists in Africa to suggest that some awareness knowledge on climate change issues are present (Pandy & Rogerson, 2018), however, these are shallow with sources of information mainly through radio and television in areas where these gadgets are found and can be afforded, and experiences with differences in rainfall patterns and rising temperatures over the years just as found in the present study. Awareness and perceptions of a problem such as climate change shapes action or inaction on the problem (Nzeadibe, & Ajaero, 2010). Consequently, understanding the perception of climate change stakeholders, such as farmers, is important as perception can shape the preparedness of these actors to adapt and change their practices (Ifejika Speranza, 2010).

While climate change affects everyone in society, the undeniable fact is, it does not world, especially the developing world and

particularly Africa experience it more. Women and children in Africa constitute an estimated huge number of the world's poor. Most women in Africa, and for that matter, Ghana, are always at the forefront of coping with the adverse effects of climate change because of their low economic status and the social role they play in society. In low and middle-income countries, women and girls are mostly responsible for providing basic needs such as water, fuel, and food, and in most communities in Ghana, caring for the sick is seen as their responsibility. When the resources that these women rely on for living become scarce, as in the case of rural farmers in the study due to effect of climate change, it increases their workload (Romero et al., 2011) which affects their health (Sorenson, et al., 2018), as they are forced to struggle through alternative ventures to cope with their situation. Some of these adaptation strategies as revealed by the study are precipitating factors to climate change which eventually destroy their environment (Enete & Thornton, 2011). Thus, effective adaptation will require the involvement of multiple stakeholders, including policymakers, extension agents, governmental organizations, researchers, communities, and farmers.

Study participants complained that the advent of climate change is affecting almost every part of their life. For instance, climate change brings about dry climate, low and erratic rainfall, and pro-longed droughts which finally affect their crops production and water resources. This also trickles down to affect their income levels, threaten their food security among other challenges. Again, the impact also increases the workload on the poor farmers and their female children. For instance, the women must walk extra miles to access water and firewood. This tends to affect girls' performance in school because they spend

most of their time searching for water and other domestic products to the detriment of their education. The female farmers indicated that even though, they are already struggling with life, the advent of climate variabilities in the area is worsening their plight.

Thus, until mechanisms and policies are carefully and systematically put in place to ensure resilience in development and reduce vulnerability (Codjoe & Atiglo 2020), climate variability will pose serious challenges to national development. Because agricultural production remains the main source of income for most rural communities, adaptation of the agricultural sector to the adverse effects of climate change will be imperative to protect the livelihoods of the poor and to ensure food security. Adaptation can greatly reduce vulnerability to climate change by making possible consequences of climate change, people's perceptions of those consequences, and available safe and approved adaptation options bare.

Conclusion

Climate change has enormous devastating impacts on rural women farmers in Ghana. The main challenges affecting these farmers' ability to cope with the current climatic problems are lack of knowledge and information about weather changes, illiteracy, and inability of some women to access and own farmlands leading to abject poverty, with its attendant economic, social, psychological, and emotional problems. Over the years, farmers and other natural resource dependent communities in the country have found varied ways of coping with these changes, based on traditional knowledge and practices. However, a better understanding of how farmers perceive climate change, ongoing adaptation measures, and the factors influencing the decision to adapt farming practices is needed to craft policies and programmes aimed at promoting successful adaptation of the agricultural sector. In making informed decisions about climate change, timely and useful information is necessary (Addaney et al., 2021; Olorunfemi 2009). This can be achieved through the incorporation of diverse perspectives, showcased different disciplines, by including human, natural, social, and economic sciences leading the understanding of climate change effects and how they can be scientifically mitigated through appropriate forecasting and planning (Nunes & Dias, 2022)

Rural female farmers must therefore be consistently educated on climate change and its effects, with training on the necessary sustainable adaptation strategies to build their resilience. Policies that target rural female farmers to appropriately adapt to climate change and device modern agricultural techniques and practices that boost food production among vulnerable farmers and minimize maladaptation strategies, are also necessary.

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Should traditional medicine services in Ghana be covered by Ghana's National Health Insurance Scheme?

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Abstract

More than half of Ghanaians use traditional medicine in addition to conventional medicine in treatment of diseases. However, traditional medicine is not covered by the National Health Insurance Scheme. This poses a serious threat to financial risk protection to users of traditional medicine as they may be exposed to catastrophic healthcare expenditure. This paper assessed whether traditional medicine services should be covered by National Health Insurance Scheme in Ghana or not. A case study design was employed to assess a traditional medicine facility in Accra, Ghana. The study adopted Ghana's National Health Insurance Scheme accreditation tools coupled with in-depth interviews with key informants. Data was analyzed using descriptive statistics and content analysis from interviews. It was found that the overall performance of the facility was 83 percent, representing grade 'A'. This implies that the facility may be considered for accreditation. However, the facility performed poorly in in-patient care, with a grade 'E', representing 'Fail. Some respondents were of the view that the facility should only be accredited on condition that it is upgraded to meet the required standards. Other respondents argued that selected service lines which meet the accreditation standards should be accredited. It was concluded that traditional medicine could be covered by NHIS, especially for outpatient care, while steps could be taken to address teething problems such as standardization of traditional medicine.

Key words- Traditional medicine, National Health Insurance Scheme, Accreditation, Ghana.

Introduction

Utilization of complementary and alternative medicine is increasingly gaining momentum in both developing and developed countries (Gyasi, Mensah, Osei-Wusu Adjei, & Agyemang, 2011; Gyasi, Mensah, & Siaw, 2015; Tindle, Davis, Phillips, & Eisenberg, 2005; Vialle-Valentin, Ross-Degnan, Ntaganira, & Wagner, 2008).

Complementary and alternative medicine, known popularly in Ghana as 'traditional medicine' refers to "the sum total of the knowledge, skill and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and (World mental illness" Health Organization, 2019) This paper uses the term 'traditional medicine'(TM) which is popularly used in Ghana. The term 'conventional medicine' (CM) is also used in place of western allopathic medicine. The WHO Global Centre for Traditional Medicine (GCTM) as at 2022 estimates that 80% of the world's population use TM. According to WHO, 88% of Member States have acknowledged their use of traditional and complementary medicine which corresponds to 170 Member States (World Health Organization, 2019). It is reported that about 80 percent of the population in Africa use TM for primary health care(Krah, de Kruijf, & Ragno, 2018; Kwapong, Normeshie, Eghan, Adjei-Mensah, & Obiri-Yeboah, 2022; WHO, 2002, 2013). These statistics show that TM plays an important role alongside CM in meeting the health needs of most populations in the world. In Ghana, it is estimated that over 70% of indigents in rural and urban areas resort to TM for both primary care and some specialized care(Gyasi et al., 2015; Krah et al., 2018).

The use of TM has a long history in Ghana. Prior to the Colonial period, TM services were patronized by Ghanaians until the British introduced CM services (Kofi Bobi Barimah, 2013). In a typical Ghanaian household, especially in the rural areas, TM is culturally acceptable, affordable and utilized by most of the people (Adams,

Sibbritt, Broom, et al., 2011; Adams, Sibbritt, & Lui, 2011). TM thrives on locally available resources, and knowledge of the health-care value of plants and their derivatives. The utilization of TM has been increasing steadily alongside the CM services (Adams, Sibbritt, & Young, 2008; Asante & Avornyo, 2013; Kofi Bobi Barimah, 2013; Krah et al., 2018).

Over the past 30 years Ghana has made significant progress in enhancing the status of TM as a viable complement to CM. There is a policy framework guiding TM practice in Ghana (Boadu & Asase, 2017). A Traditional Medicine Practice Council has also been established as an agency of the Ghana Ministry of Health, to regulate TM practice (Ministry of Health Ghana, 2019). The Ghana Health Service which is the statutory agency of the MOH responsible for direct provision of health services to the public, has established a and alternative directorate to ensure the implementation of strategies aimed at integrating TM into CM services in rural and urban areas of the country (Ministry of Health Ghana, 2019). TM practice is regulated by the Traditional Medicine Practice Act-2000 (Act 575) (Gyasi et al., 2011; Gyasi et al., 2015; Herman, Craig, & Caspi, 2005). Efforts are made by the Traditional Medicine Practice Council to bring all TM practitioners under organization, preparing national guidelines for standards of practice and ethics, and a training manual for the profession (Boadu & Asase, 2017). The Government of Ghana, through the Ministry of Health, has also established TM units in selected health facilities such as Police Hospital and LEKMA Hospitals in Accra, to provide TM treatment alongside CM treatment (Ministry of Health Ghana, 2019). The Kwame Nkrumah University of

Science and Technology (KNUST) runs a degree programme in TM. Products from the programme work in various TM health facilities in Ghana (Ministry of Health Ghana, 2005; World Health Organization, 2019). The Suntreso and Ho Government Hospitals in the Ashanti and Volta Regions respectively, also provide professional training in TM (Gyasi et al., 2015; Herman et al., 2005).

Although majority of Ghanaians have embraced TM, and despite its recognition by many stakeholders, payments for TM services is wholly out-of-pocket. Unlike CM, services provided by TM is not covered by Ghana's National Health Insurance Scheme (NHIS) (Kofi Bobi Barimah, 2013). The NHIS was rolled out nation-wide in 2005 under the National Health Insurance Act-2003 (Act 650) (Blanchet, Fink, & Osei-Akoto, 2012). The aim of the scheme is to eliminate out-ofpocket payment, address inequities in access to healthcare and protect the indigents from financial risk of accessing healthcare services (Busato, Eichenberger, & Künzi, 2006; Nahin, Barnes, & Stussman, 2016). The scheme covers primary, secondary and tertiary levels of care in public, private and faith-based health facilities in Ghana (Blanchet et al., 2012). The NHIS is funded through 2.5% Value Added Tax, 2.5% of formal sector workers' social security contributions, premium contribution from informal workers, monies allocated to the National Health Insurance Fund (NHIF) parliament, and return investments(Arhin, 2012; Blanchet et al., 2012; Gobah & Liang, 2011; Nahin et al., 2016). However, pregnant women, minors (under 18 years), indigents and adults aged 70 years and above are exempted from payment of premiums to enroll into the scheme (Akazili et al., 2014). The scheme

covers over 95% of all diseases that are reported in Ghanaian CM health care facilities (Akazili et al., 2014). Outpatient and inpatient services such as eye care services, maternity care, oral health services, surgical, and emergency care are covered under the scheme (Blanchet et al., 2012). The NHIS coverage showed an increasing enrollment since operations began in 2005 (Blanchet et al., 2012). The total number of active members rose from 2.4 million in 2006 to 11.1 million in 2009, suggesting that close to about 50% of the population is covered by the insurance scheme (Blanchet et al., 2012). The outpatient utilization of CM services under the NHIS rose from about 2 million in 2005 to approximately 27.35 million in 2013 (Pagán, Puig, & Soldo, 2007).

Given the fact that about 70% of Ghanaians patronize TM services which are not covered by NHIS (Kofi Bobi Barimah, 2013), coupled with inadequate CM services throughout Ghana, this could pose a serious threat to financial access to primary health care by the population, and undermine the attainment of Sustainable Development Goal (SDG) 3, which advocates for universal health coverage, among others. Reports indicate that as at 2018, Ghana scores only 45% in the SDG index, which is described as insufficient progress (Service, 2018). Several calls have therefore been made on the government of Ghana and the NHIS to cover TM facilities under the NHIS just like CM facilities (Kofi Bobi Barimah, 2013). According to Barimah, a renowned researcher in TM, if TM services are included in the NHIS, it is likely to increase the utilization of health services (Kofi B Barimah & Teijlingen, 2008; Blanchet et al., 2012).

A renowned TM practitioner also argued that TM providers in good standing should

be accredited by the NHIS because many Ghanaians prefer to seek care from TM providers, but are sometimes forced to use orthodox practitioners because the NHIS does not cover TM (Gyasi et al., 2015). According to the practitioner the National Health Insurance Authority remained reluctant to include TM on the programme even though TM is recognized by the Food and Drugs Authority and all the health services regulatory bodies in Ghana (Ministry of Health Ghana, 2005). He asserted that some chronic diseases like stroke, hypertension which cannot be easily treated with CM are easily cured with TM (Andoh, February 2015).

However, there is dearth of literature on relationship of health insurance coverage and use of TM. Findings of the few studies in high income countries are mixed. Some of the studies found little or no relationship between health insurance and TM use. For example, a study conducted in United States of America (USA) reported that rural residence, age, income, education, and health insurance were unrelated to TM use (Kaboli, Doebbeling, Saag, & Rosenthal, 2001). Lewing and Sansgiry (2018)examined costs, utilization, and driving factors of TM services in USA and found that about 8.8% of the adult population visited a TM provider, and about 42% of those that visited a TM office paid more than 80% out of pocket. In addition, those without health insurance were 50% more likely to seek TM provider care, suggesting a reverse relationship between health insurance coverage and utilization of TM services.

On the other hand, some studies found a large positive influence of health insurance on TM use. For example, an internet survey on the provision of complementary and alternative medicine in Japanese private clinics found that 96.8% of the clinics provided mainly health services on the universal national health insurance tariff (Motoo, Yukawa, Hisamura, Tsutani, & Arai, 2019). Kampo (traditional Japanese herbal medicine) medicines represent the most commonly used TM in private clinics in Japan, and universal national health insurance coverage is considered to be the reason for the high rate of their use (Motoo et al., 2019). Due to the demand of the presence of TM in CM, European countries like Switzerland have included some of the most common treatments such acupuncture, homeopathy, and naturopathy, as part of the national health insurance (Carruzzo, Graz, Rodondi, & Michaud, 2013; Klein, Torchetti, Frei-Erb, & Wolf, 2015). In addition, since 2004, onethird of Swiss hospitals offered TM to its patients (Saldana, 2018). This demonstrates how Western medicine in Europe, and Switzerland specifically, has been legitimizing TM as a helpful treatment, whether truly effective or not (Saldana, 2018).

There is however, paucity of studies in developing countries on whether TM should be covered by health insurance. Another important question in the context of Ghana is whether TM healthcare facilities in Ghana would meet NHIS accreditation standards, as required of CM facilities. To the best of the authors' knowledge, no research has addressed these questions yet. To fill this gap, this study aimed at assessing one of the renowned TM health facilities, using NHIS standard accreditation tools, to establish whether it meets the NHIS accreditation requirements. Interviews were conducted with key staff to seek their views on these research questions.

Methodology

Study design

This was a single case study of a renowned 20-bed capacity herbal hospital located in Ghana's capital city, Accra. For the purpose of anonymity, the herbal hospital is described here as AHH. AHH initially started operations as a manufacturing unit and a clinic. It was later commissioned as a herbal hospital. AHH has departments/units: Patient, Out Physiotherapy, Laboratory, Pharmacy, Ultrasound and Health and Fitness (Gym) departments. It has a state-of-the-art diagnostic equipment to diagnose patients' health conditions before the administration of herbal medicines and treatments.

Population and sampling

AHH has a staff capacity of 72, comprising and administrative staff. of clinical Purposive sampling was employed to select respondents for interview. A total of eleven respondents were interviewed, consisting of one administrator, six nurses, one pharmacist, one physiotherapist and one laboratory technician. We also interviewed one staff of Traditional Medicine Practice Council in the Ministry of Health. The Traditional Medicine Practice Council is an agency of the Ministry of Health which is responsible for regulating TM practice. These respondents were carefully selected based on their experience and expertise in the TM practice.

Data collection and analysis

A standard accreditation tool used by the NHIS to assess CM facilities was adopted to assess the selected TM facility. The original tool comprises of twelve dimensions (standards) ranging from range of services to pharmaceutical care. However, seven of these dimensions were considered relevant for this study. Table 1

shows the twelve standards used in assessing CM facilities by the NHIA. However, in view of the nature of services by the AHH, it was considered expedient to use seven standards including Staffing, Environment and Infrastructure, Basic Equipment, Organization Management, Safety and Quality Management, Out-patient Care and Inpatient Care. This is acceptable by the NHIA since CM facilities often indicate the level and nature of their services, based on which the NHIA assesses them.

Table 1. Standards used in assessing healthcare facilities by the NHIA for accreditation

1	Range of Services
2	Staffing
3	Environment and Infrastructure
4	Basic Equipment
5	Organization and Management
6	Safety and Quality Management
7	Out-patient Care
8	In-patient Care
9	Maternity Care
10	Specialised Care
11	Diagnostic Services
12	Pharmaceutical Services

Even though the study facility is perceived as a hospital, the accreditation tools for health centre, which is lower than a hospital, was used to assess the facility. This is because our initial checks revealed that the facility did not meet the accreditation standards of a hospital. An evaluator used the observational and interview methods to assess the health facility. A checklist which has the selected dimensions with a number sub-dimensions and measurable indicators under them was used. The indicators are often separated by commas. Each indicator is one mark if the health facility performs it, else it is zero. For

example, under the dimension 'Out-patient Care', one of the sub-dimensions is 'Provision of health education'. The indicators under this sub-dimension include: health talks given, audiovisual health programmes, programme / plan of health talks. If a facility does all these three indicators, three marks are awarded under 'Provision of health education'. But the facility can score one, two or none, out of the three.

In-depth interview with management and staff of the facility was also conducted. A staff of the TMPC was also interviewed. The interview guide comprised of twelve major themes, based on the NHIS accreditation guidelines and other relevant themes. The interviewer made prior appointment with the respondents.

Interviews were recorded and notes also taken as a back-up. On average each interview lasted for about 30 minutes. The data collected were transcribed and coded according to the emerging themes and analysed, vis-à-vis the quantitative findings.

The grading system and the accreditation guidelines with corresponding interpretations can be found in Table 2. Grades A to D, are pass grades, while E is a fail grade. However, a facility must pass 50% or above in a core area in addition to passing in the total scores to be accredited. For instance, a health facility with total score between 50 to 59% is interpreted as grade D. However, the facility must have passed 50% or more in a core area to be qualified for accreditation.

Table 2: Grading system and interpretation.

Grading system	Interpretation
Grade A + \geq 90% total score + \geq 50% in each core area	Accreditation
Grade A: $\geq 80\%$ total score + $\geq 50\%$ in each core area	Accreditation
Grade B: 70-79% total $+ \ge 50\%$ in each core area	Accreditation
Grade C: $60-69\% + \ge 50\%$ in core areas	Accreditation
Grade D: $50-59\% + \ge 50\%$ in core areas	Accreditation
	Provisional accreditation
Grade E (Fail) : Below 50%	or denial of accreditation.

Results

Results of assessment with accreditation tools

Using the NHIS accreditation standards for CM facilities, AHH was assessed to find out whether it meets the requirements for NHIS's accreditation. The facility was assessed based on seven dimensions including out-patient and in-patient care. AHH passed in six out of the seven dimensions. The dimension that AHH

failed was in-patient care. The highest score recorded by environment and infrastructure dimension, where the actual score was the same as the expected score, indicating 100% score. Scores on staffing, management, safety and quality organization and management, general outpatient care and basic equipment were 93%, 90%, 81%, 78%, 72% and respectively. However, the hospital failed to meet the expectation regarding the

provision of inpatient services. This is because the facility scored 41%, that is grade E, which is interpreted as fail. The total expected accreditation score for all the dimensions was 492. However, AHH's actual score was 408, representing 83% and equivalent to grade 'A'. (See Table 2).

Table 2: Summary of results on technical assessment of AHH*

Dimensions	Expected	Actual	Percentage Score	Grade
	Score	Score		
General Out Patient Care	57	41	72	В
Staffing	28	26	93	A+
Environment and Infrastructure	129	129	100	A+
Basic Equipment	71	47	66	C
Organization and Management	32	26	81	A
Safety and Quality Management	89	80	90	A+
In Patient Care	22	9	41	E (Fail)
Totals	492	408		
Total % Score	100	83		A

^{*}The scoring systems is a very detailed checklist which is not shown in this paper.

Results of in-depth interviews

This section presents findings of interviews with staff of AHH and the TMPC. The findings are presented according to the major themes of the interview guide.

Should TM services be covered by NHIS?

Regarding whether AHH should be accredited by NHIS, majority of the respondents were of the view that TM services should be 'covered' by NHIS. They argued that users of TM services are Ghanaians, they pay taxes and contribute to national development, therefore they are also entitled to benefit from social interventions like NHIS:

"Yes, TM should be covered by the NHIS, this will make the services of TM facilities accessible to all Ghanaians. This was the reason for establishing the NHIS" (Staff 1). "Yes, because majority of our clients are Ghanaians who also pay taxes to the state and it is a matter of choice so they should also get free service here. Some also have financial difficulties paying for

the services here. I think NHIS would help reduce the burden on these clients"

- (Staff 2)

However, a few respondents were not in support of including TM services in the NHIS. They argued that TM facilities do not have standardized and certified medicines that are accepted by all TM providers. For instance, AHH manufactures and dispenses its own medicines which may not be accepted by other TM providers, hence making it difficult for the NHIS to bill the medicines:

"TM should not be covered by the NHIS because most of their medicines are limited to the facilities operated by these proprietors. How would the cost of the medicines be determined? The orthodox medical practitioners have an essential medicines list with prices which are agreed by both service providers and the health insurance scheme, whilst the TM facilities do not have. TM should be covered after their medicines have been nationalized. That is if they have common medicines, they can all prescribe

just like prescribers in the orthodox facilities do"
-(Staff 3)

Range of services

The range of health services provided by a facility is one of the standards for NHIS accreditation. It is expected that the facility should provide services ranging from outpatient care to public health care. Respondents indicated that AHH provides range of services like that of orthodox facilities. Although not all services are provided by the hospital, the respondents suggested that the NHIS should cover the current services the hospital provides:

"We have adequate facilities and the required staff to run the facility like orthodox facilities. Even though we do not have all departments for patient care, some orthodox health institutions do not also have specialist care but are accredited by the NHIS

-(Staff 4)

However, one respondent had a contrary view. According to the respondent,

"the fact that the facility does not provide maternity services including antenatal care, deliveries and postnatal care, disqualifies the facility from being accredited by the NHIS" -(Staff 5)

Staffing

Availability of qualified staff in the right numbers and professional mix is very important in healthcare delivery and a requirement for NHIS accreditation. The respondents were of the view that AHH had the required number of qualified staffs for accreditation:

"We have the qualified staff, such as nurses, medical herbalists, lab technicians, pharmacy and ultrasound technicians who are knowledgeable in herbal medicine" (Staff 1). "The qualification required for TM practitioners to operate under the NHIS could either be a diploma or a degree in an accredited institution like KNUST, Suntreso Government Hospital and Ho Hospital. Most of the staff of AHH have training from these institutions"

-(Staff 4)

Environment and Infrastructural Systems

Respondents were unanimous that AHH has proper infrastructure and operates in a very conducive and hygienic environment, unlike other TM practitioners. According to the staff the hospital compares favourably with many orthodox facilities, hence the hospital should be accredited by the NHIS:

"Some TM facilities have poor infrastructure and operate in unhygienic environments. However, a few of them like ours are in proper infrastructure. The few with proper infrastructure and hygienic environments could be accredited and services covered"

-(Staff 6)

Basic Equipment

Basic equipment is needed by every health facility for effective operation. In this regard, respondents were of the view that the kind of modern medical equipment AHH uses in their daily operations are equivalent to those in the orthodox health facilities. Special reference was made to the kind of medical equipment used by the physiotherapy and the laboratory units:

"We have some equipment comparable to those in the orthodox facilities, especially our laboratory and physiotherapy departments operate like an orthodox facility. Some TM facilities do not have these basic equipment. For AHH we have such equipment. Our lab, scan and physiotherapy machines work like those in orthodox facilities (Staff 7). A respondent however, suggested that: "some vital services like surgery should be performed in the herbal hospital to be able to meet the standards set by NHIS"

-(Staff 8)

Organization and Management Systems

Respondents indicated that AHH is well organized and has similar organizational structure as the orthodox facilities. It will therefore be fair that it is also given accreditation by NHIS:

"Some TM facilities are well organized and have similar organizational structure as the orthodox facilities. For example, AHH has a director, an administrator and departmental heads, accounts, laboratory, physiotherapy, Out Patient Department and a pharmacy. The structure is just like that of the orthodox facilities"

-(Staff 8)

Safety and Quality Management Systems

Respondents indicated that AHH pays attention to organizational health and safety issues. Respondents revealed that the hospital has put in place safety mechanisms such as fire extinguishers and guidelines:

"The safety of our clients as well as staffs is paramount that is why there are directional signs to guide clients and visitors. The floor is not slippery, fire extinguishers are provided and there is a complaints unit for clients who think they are not satisfied with the services provided"

-(Staff 9)

Out-Patient Care

The respondents believed that even though AHH does not provide comprehensive OPD services, the services provided are very important:

"We have limited OPD services, as you can see, no antenatal and post-natal care services are rendered. However, the services we render are very important to the community"

-(Staff 10)

In-Patient Care

Respondents indicated that the hospital only admit general cases and not specialized cases:

"Our in-patient services are limited to general cases that are seen here, no specialized cases are on admission and we have only eighteen beds. Children's ward, 4 beds, male ward, 9 beds, and female ward, 7 beds

-(Staff 11)

Maternity Services

Most of the respondents shared similar views about maternal services at AHH. They believed AHH can provide maternal health services. However, the lack of midwives in the facility poses a major challenge for the provision of maternity services. Notwithstanding, some respondents contended that some CMs equally lack midwives, but have been accredited by the NHIA:

"Most TM facilities do not provide maternity services just like some orthodox facilities. However, this should not be a hindrance because some health centers do not have midwives, but their services are accredited by the scheme"

-(Staff 3)

The Level of Care of TM Facilities

Majority of the respondents were of the view that the ability of the facility to create different departments or units in the provision of various health care to the public demonstrate that the facility could be accredited to operate as a hospital:

"I will classify AHH as a hospital since we have different departments just like that of an Orthodox health facility. There is a laboratory, a scan, a physiotherapy, accounts, administration and some wards"

-(Staff 3)

Views of TMPC member

A staff of the Traditional Medicine Practice Council, which regulates TM practice in Ghana was also of the view that TM services should be covered by the NHIS and that the Council was putting in measures to that effect:

"TM services is on the verge of being integrated into the health system and he covered by NHIS nationwide. In view of that, some hospitals have already started practicing both TM services and CM in providing health care to the public"

-(A staff of Traditional Medicine Practice Council).

The staff also disclosed that some TM facilities have been given accreditation to commence business and manufacture herbal medicines. This is because such facilities adhere to organizational health and safety issues as it pertains in orthodox facilities. The respondent indicated that the MOH has provided a list of some TM facilities that could be covered by the NHIS. However, the TM Practice Council outlined some challenges it encounters as a regulatory body, such as accreditation difficulties with the Food and Drugs Authority of Ghana and the authorization

by the Ministry of Health for TM practitioners to use generic names for the herbal medicines.

Discussion

The purpose of the study was to find out whether TM services should be covered by Ghana's NHIS. An objective assessment of the suitability of one of the renowned TM health facilities (AHH) was done using tools developed by the NHIS. The overall score of AHH was 83% which represents grade 'A'. This implies that objectively, the facility may be considered for accreditation.

However, the facility performed poorly in the area of in-patient care with a score of 'E' representing fail. This cannot however disqualify the facility. There are two possibilities, either the facility may be accredited to provide only out-patient care, or they may be required to upgrade the facility to provide in-patient care before accrediting it. The other dimensions for accreditation recorded high scores ranging from 'B' to 'A+' for general out-patient environment staffing, organization infrastructure, and management and safety and quality management. However, basic equipment recorded a score of 66, representing C. Even though this is a pass, it suggests that attention needs to be paid to providing basic equipment for the facility. This finding, however, needs to be interpreted with caution, in view of the nature and scope of work of the TM facility. It should be noted that even though the laboratory and physiotherapy units have complex, state of the art equipment comparable to some orthodox health facilities, less complex and basic equipment such as ophthalmoscope, auroscope, tendon hammers, X-ray viewing equipment, height measure (stadiometer), tape measure,

suturing set, oxygen delivery equipment, functioning emergency care devices and supplies, among others, which are all part of the assessment of basic equipment, were inadequate. This inadequacy of basic equipment was more likely to be associated with their irrelevance to the nature and scope of their activities than affordability, since AHH could afford more expensive equipment. In the absence of an assessment tool developed by the NHIS for the assessment of TM facilities we had to adopt the tools developed for the CM facilities which could not fit neatly into the nature and scope of activities of the TM facilities. We recommend that in future, the NHIS should consider developing an assessment tool unique to the nature and scope of TM facilities.

With respect to the interview with the staff of AHH and TMPC, it was found that even though majority of the staff were in favour of covering TM by NHIS, a few expressed reservations. The major reasons advanced by those in favour of covering the traditional medicine with NHIS is that it will increase access to basic health services in Ghana, since majority of Ghanaians patronize TM. They also argue that AHH enough staff and infrastructure. They are also able to treat some common disease conditions, among others. This view is consistent with the literature. Several studies reported a positive influence of health insurance on TM use (Carruzzo et al., 2013; Klein et al., 2015; Motoo et al., 2019; Saldana, 2018).

On the other hand, few respondents had reservations on including TM services in the NHIS. Their main reason was luck of standardization in TM. With CM facilities, the NHIS has a medicine list with predetermined prices which all accredited health facilities throughout the country

must comply. However, some TM facilities manufacture their own medicines, thus making it difficult to have standardized medicine list. However, the fact that people patronize TM in state-of-the-art TM facilities, and the fact that TM has been integrated into some CM facilities, even though the former is not covered by health insurance is consistent with some studies in high income countries which found little or no relationship between health insurance and TM use (Kaboli et al., 2001; Lewing & Sansgiry, 2018).

In the case of Ghana, the respondent from the TMPC disclosed that TM services are being integrated into the health system for ultimate inclusion into the NHIS. The respondent however, acknowledged the major challenges of the TMPC to include the need for all TM facilities to use generic drugs that are common to all; and the difficulty in getting approval for TM by the Food and Drugs Authority. The extent to which these pose a major challenge to the inclusion of TM in the NHIS and how they may be addressed requires further studies. Another reason given for their reservation was the lack of maternity services. However, it is possible to provide accreditation excluding maternity services.

This study however, has a few limitations. First, the tools used in assessing the TM facility was developed for CM facilities, since there were no specific tools developed for TM facilities. The findings should therefore be interpreted with caution. Notwithstanding this limitation, it was realized that except for medicines, treatment procedures in the TM facilities were very much like CM facilities. The NHIS may therefore consider developing tools tailored for TM facilities if they will be covered by the NHIS. Related to this limitation was the fact that the facility was

assessed using tools developed for health centres, even though AHH is known as a hospital. However, preliminary review of the accreditation tools showed that AHH did not meet the standards of CM facilities. Another important limitation of the study is that it was not about whether TM is relevant or a useful complement to CM or not. Rather, it was about the suitability of TM facilities, based on such factors as having the requisite staff and basic equipment. Future studies may therefore investigate the relevance of TM as a complementary medicine in Ghana.

Conclusion and implications

Technically, AHH is qualified to be covered by NHIS, especially for outpatient care. This conclusion is based on the scores on the standards set. By implication, in view of the wide use of TM in Ghana and the concerns raised by some stakeholders, TM could be included in the NHIS were all other TM similar to AHH. Teething problems such as standardization of TMs are surmountable and can be addressed. Maternity services may be excluded in view the lack of infrastructure professional staff. This study provides evidence of the feasibility of including TM in NHIS. The findings will therefore provide useful insight to stakeholders and policy makers in health care in the continuing debate as to whether TM should be covered by health insurance or not. Further studies are required to examine the problem of standardization of TM and how it may be addressed.

Abbreviations

CM: Conventional medicine FDA: Food and Drugs Authority LEKMA: Ledzokuku Krowor Municipal Assembly MOH: Ministry of Health

NHIS: National Health Insurance Scheme

TM: Traditional medicine

TMPC: Traditional Medicine Practice Council

Declarations

The authors declare that there is no competing interests.

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Availability of data and materials

Data can be made available. Please contact the corresponding author.

Authors' contributions

AAA, conceived the study. WCNV, MDB, WAA and MAA collected the data. AAA and EAA carried out data analysis. All authors drafted and finalised the paper. All authors read and approved the final manuscript.

Ethics approval and consent to participate

We obtained permission from the Management of AHH and the Traditional Medicine Practice Council to undertake the study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Determinants of Foreign Direct Investment in Africa: The Role of International Accounting Standards

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Abstract

Following the widespread adoption of the International Financial Reporting Standards (IFRS) by many countries, several questions have been raised on the economic consequences of this adoption, particularly for international investments. This paper investigates whether the adoption of IFRS promotes FDI Inflows to countries from the Africa continent. The study used a panel data of 49 African countries for the period 1996 to 2016 from the World Development Indicators. Estimation of the regression model was done using the logistic regression model and the Fixed Effects Estimation Technique. The results demonstrate that African countries that have adopted IFRS on the average experience better FDI inflows than nonadopting countries. Further. natural endowment, infrastructural development, economic growth and trade openness were found to be important predictors of the amount of FDI inflows to African countries. The findings of this study suggest that the type of accounting standards adopted by African countries have important implications on FDI activities on the continent. Thus, African countries that seek to improve their business environment and investor confidence and attract FDI inflows should endeavour to strengthen their financial systems by adopting quality and internationally recognized accounting standards such as the IFRS. This study contributes to literature on the macroeconomic implication of the adoption of IFRS from an African perspective.

Introduction

The widespread adoption of the International Financial Reporting Standards (IFRS) by countries has generated intense research interest in the field of accounting within the last decade, with particular focus on the economic consequences for the adopting countries. While earlier studies have predominantly focused on

the firm-level implications of adopting IFRS, recent studies have argued for the need to examine its macroeconomic implications (El-Helaly, Ntim & Al-Gazzar, 2020; Gordon, Loeb, & Zhu, 2012; Leuz & Wysocki, 2008; Ramanna & Sletten, 2009). The argument has been that the decision to adopt the IFRS is a public-policy decision hence, restricting its impact assessment only at the firm level limits our understanding of the true consequences of the IFRS regulatory change.

In response to this call, emerging studies have sought to investigate at national level the impact of IFRS adoption on foreign direct investment (FDI) inflows (Akisik, Gal & Mangaliso, 2020; Chen, Ding, & Xu, 2014; Gordon et al., 2012; Owusu et al., 2017a; Owusu et al., 2017b). Most of these studies have employed the Ownership-Location-Internalization (OLI) paradigm as their theoretical basis to argue that adopting the IFRS potentially enhances the capacity of a country to attract FDI inflows due to its perceived desirable qualities as an accounting standard to foreign investors. most Compared other national accounting standards, the **IFRS** considered to be higher in quality in terms of disclosure requirements and hence provides more reliable accounting information to international investors (Barth et al., 2008). Again, being the world most dominant accounting standard, it has been argued that the adoption of IFRS by a country increases the comparability of financial information of firms in that country to foreign investors and therefore facilitates cross-border investment decisions (Bova & Pereira, 2012).

While the evidence provided by some existing empirical studies (Akisik, 2008; Chen et al., 2014; Golubeva, 2020; Gordon

et al., 2012; Owusu et al., 2017a) associate IFRS with growth in FDI inflows, findings of the few existing studies that focused exclusively on the African continent suggest the economic benefit of IFRS adoption may not be the same for all adopting countries. For instance, Nnadi and Soobaroyen (2015) found a negative relationship between the adoption of IFRS and net FDI inflows of some selected African countries. Their results thus. suggest that contrary to the perceived economic benefits of IFRS, its adoption could be potentially harmful to some countries in terms of their capacity to attract FDI. Nnadi and Soobaroyen (2015) in part attribute their finding to a conjecture that IFRS implementation and its outcome may be seen as a significant cost to foreign investors thereby pushing FDI flows to contexts where local forms of accounting practice may be operating. In contrast, Gordon et al (2012) believe to the extent that IFRS adoption is associated with improvement in the transparency of financial reports, it should promote FDI inflows especially in jurisdictions (such as those from the African continent) where financial reporting transparency is poor. Thus, whether the adoption of IFRS enhances the locational attractiveness of countries to FDI inflows still remain an open question.

The current study attempts to shed some new insights on this debate by analysing the IFRS and FDI nexus focusing exclusively on the African continent. We explore with a sample of 49 African countries with available data and test whether African countries that have adopted the IFRS experience better FDI flows than the non-adopting countries. Conceptually, our study differs from the empirical work of Nnadi

and Soobaroyen (2015) that measured net FDI inflow as the ratio of FDI to GDP. In its true economic sense, the ratio of FDI to GDP only measures the size of FDI relative to the GDP of the country in question and not net FDI inflows. In this study net FDI is measured in line with the World Bank view as

"the value of inward direct investment made by non-resident investors in the reporting economy, including reinvested earnings and intra-company loans, net of repatriation of capital and repayment of loans".

The empirical analysis we present in this study is relevant for three important reasons.

First, unlike countries from other regions, domestic sources of finance in Africa have over the years been woefully inadequate to support their developmental agenda (Osei, Morrissey, & Lensink, 2002). As a result, FDI inflows remain one of the important sources of external funding to African countries. However, the amount of FDI flows to Africa has also been very low compared with the rest of the world (EY attractiveness survey, 2014, p.5). This has left many African countries with a huge resource gap limiting their ability to finance public infrastructure for the needed economic transformation and poverty reduction. Studies on the factors that drive FDI inflows to the region are therefore addressing important developmental needs of the region.

Second, empirical studies on FDI generally suggest that Africa is structurally different from the rest of the world and the factors that attract FDI to Africa are different from the factors that drive FDI in other continents (Asiedu, 2002; Asiedu, 2006; Batra et al., 2003). This presupposes that

results of studies on the determinants of FDI flows from an international setting may not apply to African countries. By implication, the finding that IFRS adoption promotes FDI inflows may not hold true for African countries given that African countries are structurally different from the rest of the world. Given the importance of FDI flows to the growth potential in the region, coupled with the fact that Africa is considered to be structurally different from the rest of the world, a study that specifically examines the impact of IFRS on FDI to the region is very much needed.

Third, focusing exclusively on Africa is also relevant given that prior studies on FDI determinants to Africa is scant and research on IFRS adoption and its impact on African countries is still at the evolution stage. With several countries from the continent already using the IFRS, an investigation into the impact of IFRS on FDI inflows to the region may not only be useful to policymakers in this region but also to the international bodies such as the International Accounting Standard Board (IASB) interested in assessing the impact of IFRS adoption.

The rest of the paper is organised as follows: we review the literature on IFRS adoption and FDI inflows and the moderating role of institutions in this relationship in the next section. We then discuss our empirical model, econometric methodology and the data employed in the analysis. A discussion of the econometric results from our estimations is then presented before providing summary insights, conclusions and policy implications from the study findings.

Literature review

Accounting standards and Foreign Direct Investment Inflows

FDI inflows undoubtedly have remained one of the important external financing sources to many developing economies for decades. While the relevance of FDI to the economic development of countries is well established in the literature, access to FDI has remained uneven across countries over the years (Leuz, Lins, & Warnock, 2010). Accordingly, extensive research has been conducted to identify the dominant factors that account for the differences in the amount of FDI inflows to countries. Notwithstanding the fact that significant amount of research effort has been devoted to the determinants of FDI, there is still no widely accepted set of explanatory variables regarded as "true" determinants of FDI (Gordon et al., 2012; Kok & Ersoy, 2009).

However, variables such as the growth rate of GDP, inflation, interest rates, exchange rates, openness of the economy, quality of institutions, infrastructure development, natural resource endowment have been documented on a consistent basis in several empirical studies to be determinants of FDI inflows (Asiedu, 2002; Chakrabarti, 2001; Lay & Wickramanayake, 2007; Onyeiwu, 2004). Theories such as the Gravity Model, Hymer's Firm-Specific Advantages Theory, Theory of Transaction Cost Economics, Dunning's Eclectic Paradigm and Information Asymmetry Theory have often been employed to explain movement in capital from one country to the other. Proponents of information asymmetry, in particular, argue that the availability of information plays a key role in the decision to invest in foreign markets. Leuz et al. (2008) posit that investors in foreign markets are usually at an informational disadvantage relative to local investors. Compared with the foreign investor, access to information on domestic

businesses are far easier and faster for a local investor. Foreign investors usually have to incur additional cost in order to get informed which increases the overall cost of investment in foreign markets.

From an accounting information perspective, informational disadvantage usually arises when there are differences in accounting standards between the home country of the investor and the host country (Khurana & Michas, 2011). It is common knowledge that investors will usually refer to a firm's financial statements in making their investment decisions. Difficulties in interpretation arise when accounting information from host countries are based on accounting standards and disclosure requirements that differ greatly from the home country of the investor. The challenge in interpreting financial statements compiled different accounting standards can act as an impediment to foreign investment (Bradshaw, Mark, Brian & Bushee, 2004). It is on the basis of this that some existing studies argue that investors' familiarity with accounting standards have important implications on cross-border investment activities (Beneish et al., 2012; Chen et al., 2014; Gordon et al., 2012; Khurana & Michas, 2011).

From the information costs argument, the rational deduction will be that any change that would decrease foreign investors' information costs should potentially increase cross-border investment. With several countries already using IFRS as the basis for financial reporting, it has been argued that it has the potential to reduce information frictions faced by investors in foreign markets (Beneish et al., 2012; Omotoso, Schutte & Oberholzer, 2022) and hence, its adoption by a country could be helpful in attracting foreign investors

into that country.

In terms of IFRS adoption and FDI nexus however, most existing studies (Chen et al., 2014; Gordon et al., 2012; Nnadi and Soobaroyen, 2015; Owusu et al., 2017a; Owusu et al., 2017b) have relied on Dunning's Eclectic Paradigm (Dunning, 1977; 1988) to explain the link between IFRS adoption and FDI. Commonly referred to as the Ownership, Location and Internationalization (OLI) paradigm, the theory postulates that FDI decisions of multinational firms usually rest on three ownership-specific main pillars: advantages, location-specific advantages and internalization advantages. Within the OLI paradigm, the accounting system of a (specifically the applicable accounting standards) is believed to be one of the important factors that enhances the locational attractiveness of a country to FDI. Based on the tenets of this theory and consistent with its application by prior studies (Chen et al., 2014; Gordon et al., 2012; Nnadi and Soobaroyen, 2015; Owusu et al., 2017a) we argue that the adoption of IFRS would have a positive effect on the amount of net FDI inflows to a country.

IFRS Adoption and FDI

Studies on IFRS adoption and its macroeconomic outcomes though limited have been on the rise within the last decade. Notwithstanding the fact that the main aim for the introduction of the IFRS is to improve comparability of accounting information for users across countries (Horton, Serafeim, & Serafeim, 2013), using a uniform set of accounting standards is believed to also have cross-border investment benefits (Bova & Pereira, 2012; Tweedie & Seidenstein, 2005). The argument is that using the same set of accounting standards effectively reduces

information asymmetry between firms and their external parties. According to Gordon et al. (2012), any reduction in asymmetric information obtained by a country's IFRS adoption should make the country more attractive for foreign capital inflows than would otherwise be the case. Thus, adopting IFRS in a way improves a country's locational attractiveness to foreign investors and hence promotes inflows of foreign investment.

To some extent, the above theoretical assertion has received empirical support from some studies that have investigated IFRS adoption and FDI inflows. Based on the gravity model, Márquez-Ramos (2011) analysed the effect of IFRS adoption on FDI and concludes that IFRS adoption correlates positively with FDI flows of countries that have adopted the IFRS. Chen et al. (2014) similarly examine IFRS adoption as a driver of FDI and their study also reports findings consistent with Márquez-Ramos (2011). Unlike these two studies that relied on data on bilateral crossborder flows of FDI, Gordon et al. (2012) investigate the effect of IFRS on the total FDI inflows to a country from all other countries. Results of their study however, affirm the notion that IFRS adoption positively correlates with FDI inflows to countries.

Nnadi and Soobaroyen (2015) however, found the effect of IFRS adoption to be negative on net FDI of African countries. While the authors contend that the public policy decision to adopt IFRS should be seen as part of the location advantage that attract FDI, their finding in sharp contrast suggests adopting IFRS could potentially discourage FDI into African countries. The study by Owusu et al. (2017a) however, points out that notwithstanding its touted potential as an accounting standard, merely

adopting IFRS would not position countries especially developing countries to attract FDI inflows unless supported by a framework. institutional strong authors argue that the presence of quality institutions is very critical to harnessing the economic benefits associated with the IFRS adoption. In effect, notwithstanding its perceived economic benefits as a global accounting standard, the mere adoption of IFRS by developing countries may not be enough to attract FDI unless the adoption decision is supported by reforms aimed at strengthening the quality of institutions in such countries. Given that African countries are generally considered to be structurally different from the rest of the world and coupled with the fact that the factors that drive FDI inflows to Africa are different from what pertains in other continents (Asiedu, 2002; Asiedu, 2006; Batra et al., 2003), an investigation into the IFRS-FDI nexus within the context of Africa may be useful in deepening our understanding economic of the consequences of IFRS adoption.

Accounting Systems and IFRS Regime in Africa.

Historically, most African countries are known to have adopted the systems and practices of their colonial masters at independence (Joireman, 2001). Just as their religion, language, legal systems, institutional framework and many other practices have been largely based on standards and practices from their colonial masters, the accounting systems and practices of most African countries to a large extent have traditionally mirrored the systems and practices of their colonial masters. As Nnadi (2012) surmised, the attainment of independence by African countries were purely political in nature and did not guarantee the independence of their accounting system or standards.

Colonisation is therefore considered as the major factor in the development of accounting systems in Africa.

For the majority of African countries that were once colonized by the British (such as Ghana, Nigeria, Kenya etc), accounting system and practices have been inspired by the British accounting system, while the accounting system of most francophone countries is basically a replica of the French system. Interestingly, within the African continent, the decision to adopt IFRS appear to follow the same trend. In terms of the adoption of IFRS by African countries, it has been observed to be closely linked with the predisposition of their former colonial masters towards the IFRS. From this neo-colonial perspective, it has been observed that a greater number of African countries colonized by the British have adopted IFRS or permitted its use, while very few African countries that were colonized by the French and other European countries have adopted the IFRS in any form (Nnadi, 2012). Thus, even in the post-independence era, most African countries continue to depend on their former colonial masters in several ways including the direction of their accounting systems. Table 1 (appendix) summarizes the adoption status of the 54 African countries. As shown in Table 1, seventeen (17) countries representing 31.5% of the 54 African countries have adopted the IFRS. Out of the 17 countries that have adopted IFRS, twelve (12) countries representing 70.6% of the number were once colonized by the British. The above statistics demonstrate that the motivation to adopt the IFRS is higher among African countries previously colonized by the British.

Methodology

This study uses a panel data of 49 African countries from 1996 to 2014 (with three-

year spaces). Data on FDI were sourced from the World Development Indicator (WDI) database published by the World Bank. Data on the IFRS adoption status of countries were obtained from the Internet database of the International Accounting Standard Board (IASB)http://go.ifrs.org/global-standards. Where necessary, the official websites of national standard-setters of countries were also consulted to confirm the adoption status. Data on regulatory quality was obtained from the World Governance Indicators, published by the World Bank. Data for all

other control variables for the study (infrastructure development, market size, inflation, openness to trade, natural resources availability, financial openness) were obtained from the WDI database. All values are denominated in US dollars at year-on-year exchange rates, for ease of analysis and comparability.

Empirical Specification

To examine the effect of IFRS adoption on FDI inflows, we follow Nnadi and Soobaroyen (2015) to specify a linear regression model as follows:

 $\ln FDI_{ii} = \beta_1 + \beta_2 Adopt_{ii} + \beta_3 \ln \inf r_{ii} + \beta_4 \ln regqual_{ii} + \beta_5 GDP_{ii} + \beta_6 \ln \inf_{ii} + \beta_7 \ln Nat_{ii} + \beta_8 \ln Tropen_{ii} + u_{ii}$ --(1)

Where FDI refers to net Foreign Direct Investment measured. The explanatory variables are Gross Domestic Product (GDP), Inflation (Inf.), Natural Resource Infrastructure (Nat.), (infr), Openness (Tropen) and Regulatory Quality (reggual). Adopt refers to whether the country adopted IFRS and in what year it was adopted. The subscripts i refers to the country and t refers to the time unit. The "ln" before the variables in the model indicates the natural log of the variables. The coefficients of the regression estimates can thus be interpreted as percentage changes. Our model differs from that of Nnadi and Soobaroyen (2015) in the measurement of our dependent variable. While Nnadi and Soobaroyen (2015) measure FDI as a proportion of GDP, this can be problematic as GDP is used in the same equation as an independent variable. Besides, Nnadi and Soobaroyen (2015) use GDP per capita as another explanatory variable in the same equation where GDP is measured creating the possibility of double counting for the same variable.

We use Gross Domestic Product (GDP) as a proxy for market size. It is expected that a large domestic market would have a positive effect on the flow of FDI to African countries. Inflation is used as a proxy for macroeconomic stability. The expectation is that higher inflation rates mean higher macroeconomic instability and could scare away foreign investors. Hence, it is expected to have a negative effect on FDI inflows. Openness to trade reflects the host countries' trade relations with the world and it is computed as the sum of imports and exports as a ratio of GDP. This is expected to have a positive effect on FDI as investors will be more attracted to countries that are more open to trade. Regulatory Quality Index is one of the institutional variables and it measures the perception of the government's ability and likelihood of formulating implementing policies that activities of the private sector. We expect a positive relationship between the regulatory quality variable and FDI inflows. Level of infrastructure development and

availability of natural resources are also expected to increase the locational attractiveness of countries to FDI inflows; hence, the coefficients of these variables are expected to be positive.

Equation (1), which is our base model, was estimated using the ordinary Least Squares Approach. However, being mindful of the effect of endogeneity issues on our estimated results, we adopt a two-step approach to the empirical analysis following the discussion by Lungu, Caraiani and Dascălu (2017) and Nnadi and Soobaroyen (2015). For instance, it has been argued that developing countries may adopt IFRS standards with the hope of attracting foreign investors and probably funds from the World Bank as this sends a signal of transparency in financial reporting and hence the ability of investors to be at ease in understanding such reports and making their investment decisions. Besides countries with a huge volume of FDI inflows may likely adopt the standards probably due to investor's pressure in order to sustain such investments. This means that FDI inflows may likely affect the adoption of IFRS, hence the possibility of reverse causality. This, therefore, requires that IFRS is purified of this endogeneity so that it does not affect the true effect of IFRS on FDI inflows into the country.

To achieve this, we adopt a two-stage regression model. In the first stage, we predict the probability of a country adopting IFRS, conditional on a set of explanatory variables, using the logistic regression model specified in equation 2. The logistic regression model is used when the outcome of interest is binary.

$$\begin{split} IFRS_{it} &= \beta_1 + \beta_2 \ln F \, DI_{it} + \\ \beta_3 \ln r \, r_{it} + \beta_4 \ln r \, egqual_{it} + \\ \beta_5 GDP_{it} + \beta_6 \ln inf_{it} + \beta_7 \ln N \, at_{it} + \end{split}$$

$$\beta_8 \ln T \, ropen_{it} + u_{it}$$
 (2)

Adoption (IFRS) is coded as one if the country has adopted the IFRS and zero otherwise. The independent variables used are FDI, Inflation, regulatory quality, GDP, infrastructure, natural resource and trade openness. Based on equation 2 we obtain the estimated values of IFRS adoption which we use in the second stage of our analysis as specified in equation 3, where 'Adopt' is the estimated IFRS adoption variable from the first stage.

$$\begin{aligned} & \ln F \, DI_{it} = \beta_1 + \beta_2 A dopt_{it} + \\ & \beta_3 \, lninf \, r_{it} + \beta_4 \, ln \, r \, egqual_{it} + \\ & \beta_5 G D P_{it} + \beta_6 \, lninf_{it} + \beta_7 \, ln \, N \, at_{it} + \\ & \beta_8 \, ln \, T \, ropen_{it} + u_{it} - \cdots - (3) \end{aligned}$$

Equation 3 is specified to address the effect of adoption of IFRS on FDI inflows into the country using the estimated values of adoption from the first stage regression. We carry out two basic estimations using the fixed effect and the random effect models using equation 3. We conduct the Hausman (1978) test to choose the appropriate model from the study. We also test for Heteroscedasticity using the White's (1980) test. Our test indicates the appropriateness of the random effects model. Hence, we discuss the results of the random effects model, which was also adjusted for heteroscedasticity.

Results

Descriptive statistics and Correlation matrix

Before proceeding with the empirical analysis, we explored the characteristics of the data set by means of descriptive statistics and correlation analysis. Table 2 presents results of the descriptive statistics of the data set. From Table 2, the mean level of FDI is 0.81 with a standard deviation of 0.39. In addition, we find that the proportion of countries which have adopted the FDI are 18 per cent. The average rate of inflation in the study period was 1.72% and the average GDP per capita in the study period is 7.06. On average most countries in our sample do not have a very

strong regulatory quality judging from the mean of regulatory quality in the descriptive. We report in Table 3 the correlation matrix for the variables used in the regressions. The table shows that correlations between independent variables are low and therefore there is no high degree of multicollinearity in our regression model.

Table 1: Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
IFRS dummy	364	0.18	0.39	0.00	1.00
FDI	356	0.81	1.41	-8.12	4.12
Natural Resources	360	13.50	13.78	0.00	81.26
Inflation	346	1.72	1.21	-2.47	9.06
Infrastructure	364	34.76	41.16	0.00	164.95
Trade openness	344	77.37	45.01	20.31	478.87
GDP per capita	360	7.06	1.08	5.27	9.85
Financial openness	364	0.31	0.30	0.00	1.00
Regulatory quality	364	-0.66	0.60	-2.23	1.08

Table 2: Correlation Matrix

	lnfdi	adopt1	Inatures	Linfl.	linfras	ltrade	lgdppc
Log of FDI	1						
Adoption (estimated)	0.1673	1					
Log of natural resources	0.0935	-0.2789	1				
Log of inflation	0.0101	-0.0951	0.1363	1			
Log of Infrastructure	0.3616	0.4473	-0.0637	-0.156	1		
Log of Trade Openness	0.5492	-0.1375	-0.1445	-0.0041	0.2878	1	
Log of GDP	0.2285	0.3297	-0.3342	-0.1029	0.3569	0.5027	1
Regulatory Quality	0.0429	0.4902	-0.5432	-0.2665	0.1489	0.0771	0.3292

Empirical results and discussions

Table 4 presents the empirical results from our estimations. The initial results based on equation 1 using the OLS regression technique is presented in the first panel of Table 4. Panel 3 of Table 4 presents the results of the logistic regression model used to estimate the adoption variable. Panels 4 and 5 contain results of the fixed effect and

random effect estimations respectively.

Table 3: Results from the empirical model

	(OLS)	(Logit)	(FE)	(Re)
VARIABLES	lnfdi	IFRS dummy	lnfdi	lnfdi
IFRS adoption	-0.0581	-		
•	(0.110)			
Log FDI	. ,	-0.0122		
		(0.270)		
IFRS adoption (estima	ted)		1.815***	1.665***
			(0.391)	(0.423)
Log Natural resources	0.142***	-0.0105	0.238***	0.188***
	(0.0275)	(0.112)	(0.0587)	(0.0439)
Log of inflation	0.0222	0.928***	0.0421	0.0150
	(0.0338)	(0.219)	(0.0374)	(0.0294)
Log infrastructure	0.0848***	0.591***	0.0463**	0.0364**
	(0.0180)	(0.108)	(0.0180)	(0.0175)
Log trade openness	0.997***	-1.383***	1.183***	1.261***
	(0.103)	(0.527)	(0.218)	(0.158)
Log GDP per capita	-0.493	-2.129	-2.549	-1.218*
	(0.352)	(1.801)	(2.183)	(0.645)
Financial Openness	0.428***	0.788	-0.357	0.118
	(0.120)	(0.530)	(0.268)	(0.175)
Regulatory quality	0.187**	2.630***	0.710***	0.331**
	(0.0925)	(0.713)	(0.159)	(0.139)
Constant	-3.140***	6.248	0.112	-2.978***
	(0.627)	(3.863)	(4.156)	(1.114)
Observations	307	307	299	299
R-squared	0.413		0.483	0.4356
Number of id	49	49	49	49
Hausman Test:	$Chi^2 = 10.37$	P>chi2 =		
		0.17		

Values in parenthesis are standard errors, *, ** and *** indicate significance at 10%, 5% and 1% respectively

The estimated results based on the OLS regression technique, however, may be potentially affected by biases related to endogeneity. Consequently, a two-stage estimation approach is employed to further analyze the study objectives as specified in equations 2 and 3. After estimating the adoption variable in the first stage, we employ both the fixed effects and random effects estimation techniques, and the results are presented in the fourth and fifth

panels of Table 4, respectively. While the results of the fixed and random effect estimations are not substantially different, the random effect result was chosen as the most appropriate for this study based on the Hausman test results. The results from the random-effects model, however, indicate that inflation and financial openness have no effect on FDI inflows.

As shown in Table 4, results from the

effect estimation random technique indicate the adoption of IFRS correlates positively with the amount of FDI inflows to countries. Specifically, at a 1% level of significance, countries that have adopted the IFRS received about 166.5% more inflows than countries that rely on their own domestic accounting standard for financial reporting purposes. significance of the IFRS adoption variable in the model suggests total FDI inflows into countries that have adopted the IFRS is about 166.5% higher than countries that are yet to adopt the IFRS. This finding thus, supports the evidence provided by some existing studies (Chen et al., 2014; Gordon et al., 2012) that adopting IFRS has crossborder investment benefits to a country. The explanation is that compared with most domestic accounting standards, foreign investors easier find it understand the accounting process of countries that have adopted the IFRS and are therefore more willing to invest in such countries. The argument is that IFRS is more global and by far the world most dominant accounting standards which most foreign investors are familiar with. Its adoption, therefore, reduces significantly the volume of adjustments foreign investors would otherwise have made in comparing financial statements companies in different countries (Ball, 2006). It is well acknowledged that differences in accounting standards and disclosure requirements invariably increases the cost of investing in foreign markets usually in a form of additional information costs and hence serves as a disincentive to foreign investors (Ahearne et al., 2004).

An analysis of the control variables largely suggests our findings are consistent with theory and existing empirical studies on FDI determinants. As shown in Table 3, a positive and highly significant association was found between the availability of natural resources and the amount of FDI to the sampled Specifically, at the 5% level of significance, a 10% increase in the availability of natural resources in a country increases FDI inflows by 16%. This implies that African countries that are endowed with abundant natural resources are more attractive destinations to FDI inflows. Resource availability is, therefore, an important determinant of the amount of FDI inflows into countries in Africa. This is not surprising given that most investments into the African continent are usually targeted at the extractive sector due to the fact that most African countries are endowed with natural resources. Empirically, several studies (Aleksynska & Havrylchyk, 2013; Asiedu, 2006; Morisset, 2000) have shown that availability of natural resources has always been an important consideration for foreign investment decisions (Asiedu, 2006; Morisset, 2000). This explains why African countries (e.g. Angola and Nigeria) that are rich in natural resources such as oil and other mineral deposits are usually preferred foreign investors', destinations for especially resource-seeking investors.

The results also indicate that the level of infrastructural development matters for FDI flows in Africa. We observe a positive significant relationship between infrastructure development variable and FDI inflows at a 5% significant level. Specifically, a 10% improvement in infrastructure in the county increased the inflow of FDI by about 4.8%, at the 5 per cent significance level. As pointed out by Asiedu (2002), the presence of good infrastructure in a country in the form of telecommunication, transportation, reliable supply of power, internet access and the provision of water lowers the cost of doing

business significantly in that country. This is because the availability such of infrastructural facilities saves prospective investors huge sums of money that would have otherwise gone into providing them. Countries with the good physical infrastructural base are therefore able to attract more investment than countries with poor infrastructure (Morisset, 2000)

The degree of trade openness was also positively associated with total FDI inflows to African countries. Specifically, countries that are more open to trade received an increase in FDI by about 127% than countries that were less open to trade at the 1% level of significance. We also find that openness to trade serves as a major boost to the attraction of FDI into the country. Specifically, an improvement in the trade terms or openness of countries to trading increases the inflow of FDI into the country by 1.26%. This may be explained by the fact that investors may interpret the openness of the country to trade to mean a high market, particularly externally, for their products and therefore find it profitable to invest in such countries.

Our findings also indicate the significance of GDP per capita in influencing the amount of FDI inflows into a country. GDP per capita is used as a measure of the of economic growth development. The traditional argument is that high-growing economies are usually characterized by large domestic markets, favourable macroeconomic policies and provide relatively better opportunities for making profits than slow-growing or stagnant economies (Chakrabarti, 2001; Onyeiwu, 2004). This means that countries with high growth rates provide better assurance to prospective investors in terms of returns and the security of their investments. Hence, the expectation is that

countries with high GDP per capita are more attractive targets for foreign investors. Contrary to this expectation, our finding suggests a negative and albeit weakly significant relationship between GDP per capita and FDI inflows.

As shown in Table 4, an increase in GDP per capita by 1% reduces the inflows of FDI by approximately 1.2%. While this appears curious, some empirical studies have reported such negative effects of GDP per capita on FDI. For example, Buchanan et al. (2012), Jensen (2003), and Wint and Williams (2002) all find an inverse relationship between GDP and FDI inflows to developing countries. countries develop, it may be necessary to find other means of attracting investors or improving the earnings in order to still attract the desired level of FDI inflows. The argument by these studies is that as an economy expands, the standard of living also rises leading to high labour cost and the high cost of capital which ultimately increases the cost of production thereby making such an economy less attractive to foreign investors.

Our results also indicate that regulatory quality which captures the perception of government's ability to formulate and implement sound policies and regulations that promote private sector development in a country also matter for FDI attraction country. Specifically, improvement in the quality of regulation in a country by 1% improves the inflow of FDI into the country by 0.3%. This finding is expected given that countries with quality regulatory environments are characterized by free market operations and are competition which conducive environments for foreign investors. Moreover, in an environment where the quality of regulation is high, there is usually

the absence of unfriendly market policies such as price controls and are also free from excessive regulatory burden. According to Lucke & Eichler (2016), an environment that is characterized by a highly-developed regulatory framework is usually demonstration of the existence of clear, predictable and friendly economic policies critical to private sector growth and development which are critical to the investment decision in foreign environment. Empirically, Shima Gordon (2011) document that, adopting IFRS may be of little consequences to foreign investors if the regulatory environment is weak.

Summary, Conclusion and Implications of findings to African countries

This study explored whether the adoption of IFRS could in anyway be associated with the value of FDI inflows to African countries. The study builds on and extends emerging empirical literature on IFRS adoption and FDI inflows using country-level data from 49 African countries. By employing the random effect technique to estimate the empirical model, we document that African countries that have adopted the IFRS experience better FDI inflows than non-adopting countries. Also, evidence of this study indicates that the attractiveness of a jurisdiction to FDI

inflows is enhanced significantly by the quality of regulations in the country. Further, consistent with several empirical studies, natural resources endowment, level of infrastructural development, economic growth and trade openness were all found to be important predictors of the amount of FDI inflows to African countries.

As highlighted by the results of this study in the discussion section, the type of accounting standards a country adopts and the extent to which the applicable standards and regulations are complied with by reporting entities in a country have serious implications on FDI activities in that country. Hence, an important avenue by which African countries can improve their environment and confidence and attract FDI inflows is to strengthen their financial systems by adopting quality and internationally recognized accounting standards such as the IFRS. Again, given that the capacity to comply with any internationally recognized accounting standards and good practices is critical, African countries that have adopted the IFRS should focus on building capacity of the various regulatory bodies in the financial sector to effectively execute their oversight responsibilities over the entities they regulate. This will ensure compliance with the IFRS provisions which is critical to harnessing the economic benefit adopting the IFRS.

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Appendix:

Table 1 IFRS adoption status of countries in Africa

Country	Adopt	Year	
Country	YES	NO	rear
Algeria	V		2010
Angola		$\sqrt{}$	
Benin		$\sqrt{}$	
Botswana	$\sqrt{}$		2003
Burkina Faso		$\sqrt{}$	
Burundi		$\sqrt{}$	
Cabo Verde		$\sqrt{}$	
Cameroon		$\sqrt{}$	
The Central African Republic		$\sqrt{}$	
Chad		$\sqrt{}$	
Comoros		$\sqrt{}$	
Congo, Dem. Rep.		$\sqrt{}$	
Congo, Rep.		$\sqrt{}$	
Cote d'Ivoire		$\sqrt{}$	
Djibouti		$\sqrt{}$	
Egypt, Arab Rep.		$\sqrt{}$	
Equatorial Guinea		$\sqrt{}$	
Eritrea		$\sqrt{}$	
Eswatini (formerly Swaziland)	$\sqrt{}$		2012
Ethiopia		$\sqrt{}$	
Gabon		$\sqrt{}$	
The Gambia		$\sqrt{}$	
Ghana	$\sqrt{}$		2007
Guinea		$\sqrt{}$	
Guinea-Bissau		$\sqrt{}$	
Kenya	$\sqrt{}$		1999
Lesotho		$\sqrt{}$	
Liberia		$\sqrt{}$	
Libya		$\sqrt{}$	

G 4	Adopt	ion status	X 7
Country	YES	NO	Year
Madagascar		V	
Malawi	$\sqrt{}$		2001
Mali		V	
Mauritania		$\sqrt{}$	
Mauritius	$\sqrt{}$		2001
Morocco		$\sqrt{}$	
Mozambique	$\sqrt{}$		2010
Namibia	$\sqrt{}$		2005
Niger		$\sqrt{}$	
Nigeria	$\sqrt{}$		2012
Rwanda	$\sqrt{}$		2008
Sao Tome and Principe		√	
Senegal		$\sqrt{}$	
Seychelles		V	
Sierra Leone		$\sqrt{}$	
Somalia		$\sqrt{}$	
South Africa	$\sqrt{}$		2005
South Sudan	$\sqrt{}$		2011
Sudan		V	
Tanzania	$\sqrt{}$		2004
Togo		$\sqrt{}$	
Tunisia		V	
Uganda	$\sqrt{}$		1998
Zambia	$\sqrt{}$		2008
Zimbabwe	$\sqrt{}$		2010

Application of Survival Model to Analyse Default Rates of Personal Bank Loans: The Case of a bank in Ghana

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Abstract:

The high levels of non-performing loans in Ghana over the past few years reduced the profitability of the banking industry which have caused bank failures that have adversely affected economic development. The study identifies the predictors for the risk of default of personal bank loans using data from a rural bank in Ghana. A sample of 196 personal loan was examined. The number borrowers dependants, educational level, type of employer, gender, age, and marital status were noted. The Cox Proportional Hazard model was fitted using the sample data. Educational level, gender, age, and marital status were found to be non-significant predictors of default. However, the number of dependents and employer type were significant predictors of hazard. It was observed that hazard increased by 21.025% for an additional dependant a borrower takes on. The risk of default is 84.118% higher for a borrower whose employer is not government as compared to a government employee.

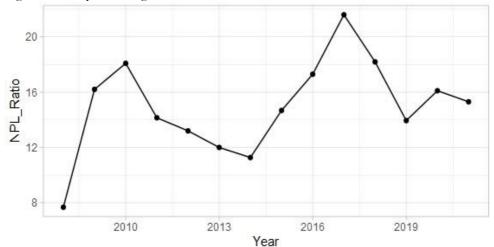
Key words: bank failures, Cox proportional hazard model, non-performing loan, risk of default, survival probabilities

Introduction

Loans are a significant part of the assets of banks. However, the rate of loan default in Ghana is on the increase due to poor analysis of the background of borrowers (Boachie, 2016). Records from the World Bank, and Census and Economic Information Center (CEIC) indicate that the non-performing loan (NPL) ratio of the country, which is a measure of the ratio of non-performing loans to total gross loans, reached a peak of 23.4% in April 2018. It was 22.7% in 2002, 18.08% in 2010, and in 2016, it was 17.29% (World

Bank, 2021; CEIC, 2021).

Figure 1: Non-performing Loan rate of Ghana



These high levels of non-performing loans (NPLs) are a cause for concern as they hurt the country's economy and the livelihood of the citizenry. Im et al. (2012) have argued that loan default has negative implications for the lender and the borrower. The borrower's credit standing is severely damaged making it difficult to secure a subsequent affordable loan. Banks on the other hand suffer because of loan default and in some cases, could result in insolvency due to the inability of their customers to pay back loans (Asantey and Tengey, 2014). The 2017 - 2019 banking sector crisis in Ghana saw some prominent banks, several rural banks, and Micro financial institutions collapsing, leaving thousands of people jobless. Other people had their monies lost or locked up. Key among the reasons given by the Bank of Ghana (BoG) for the collapse of these banks was insolvency due to NPLs on the banks' books mainly due to interrelated lending, loan approval without process, necessary lending to borrowers, breaching the single obligor

limit and general low compliance to common Corporate Governance practices (Aboagye, 2020; Osei et al., 2019; Torku and Laryea, 2021). It is undeniable that a major part of the income of banks is the interest earned on loans (Boachie, 2016; Whited et al., 2021). However, poor statistical analysis of the demographic backgrounds of borrowers before loans are issued due to numerous and competitive quick loan facilities in the banking sector has resulted in huge NPLs (Boachie, 2016; Nikolopoulos & Tsalas, 2017). Boateng and Oduro (2018)found demographic characteristics such borrowers' as educational level and the number of dependents, among other factors, have significant effect on default when they used the logistic regression model to analyse data of loan beneficiaries in Northern Ghana. Similarly, Agbemava et al. (2016) found marital status, and high dependency ratio to be statistically significant determinants in the prediction of loan default payment with a predicted default rate of 86.67%. An earlier study by Volkwein and Szelest

(1995) also found that earning good grades, persisting in completing a college degree, being married, and not having many dependent children substantially increase the likelihood of repayment and lower the likelihood of default. Fhatuwani and Karabo (2013) likewise found several sociodemographic variables including age, occupation, marital status, gender, number of dependents, residential area, education level, unemployment rate, and date since employment, to influence credit default. This study seeks to use survival analysis to estimate the hazard function for loan applicants of a rural bank in Ghana and use it to assess the relationship between predictor variables and the risk of default (hazard).

Concept of Loan Default and NPL

In the financial market, loan default is claimed to be the oldest and most significant form of hazard (Adams & Mehran, 2003; Agbemava et al. 2016; Arku 2013). A loan is defined to be delinquent when it is late in its payment. When the chances of recovery of a delinquent loan are minimal, it is said to have defaulted (Arku, 2013). A loan default occurs when a debtor fails to oblige to the legal obligations of a loan contract. This could be due to failure to make scheduled payments or violation of the terms and conditions of the loan. Murray (2011), and Pearson and Greef (2006) asserted that a loan default occurs when a borrower fails to pay back a debt or does not comply with the loan term agreement. Per the concept of Alton and Hazen (2001), a loan becomes nonperforming if the full payment of principal and interest is unmet on the maturity date nor is it anticipated in the future. Their concept is in agreement with International Monetary Fund (IMF, 2005) which went further to categorised NPL into

three subsections namely;

- When debtors have not paid interest or principal payments in at least 90 days or more.
- When interest payments equal to 90 days or more have been capitalized, refinanced or delayed by agreement.
- When payments have delayed by less than 90 days, but come with high uncertainty or no certainty the debtor will make payments in the future.

It is crucial to know however that the definition of NPL differs across various banking systems (Cucinelli, 2015). NPL globally is a measure of the financial health of the banking sector of economies which necessitates policymakers to consider its relevance for the stability macroeconomy (Asafo, 2018).

Survival Analysis vs The Generalised Logistic model

In their study, Madormo et al. (2013) suggested that survival analysis modelling for credit risk models leads to more robust conclusions when they compared the results of the survival model to classical models like generalised linear models based on logistic regression and non-parametric techniques based on classification trees. Banasik et al. (1999) likewise studied when borrowers will default. They postulated that significant results could be achieved by applying the survival analysis techniques to credit scoring when they compared the survival analysis approach to logistic regression in their estimation of which credits will be paid off ahead of schedule within the initial year and which clients still reimbursing after a year will pay off right on time within the following year. They observed that the PH model is at par with the logit regression approach in the identification of the people who default the primary year. They also demonstrated that the Cox PH model is better than the logistic model for observing who will pay off right in the primary year. Stepanova and Thomas (2001) studied the use of Cox Proportional Hazard (Cox PH) regression in building behavioural scoring models. They found the PH analysis of behavioural scores is highly competitive with the conventional logit modelling scores, particularly after about two (2) years into the credit. They argue that the movement of lenders from scoring techniques has made it important to use Cox PH regression since it could approximate the 'survival' likelihood of the credit over the long haul which is the likelihood of getting each month's reimbursements.

Whalen (1991) also argued that the Proportional Hazards (PH) model could be used to build an efficient early warning tool against bank failure. Similarly, Alves et al. (2009) explain the main financial ratios of private bank failure in Brazil using survival analysis. Lariviere and Van den Poel (2004) successfully used the PH model and Multinomial Probit Analysis in their study on how product features affect savings and investment customers of a large Belgian financial service provider.

Several early studies including Annesi et al. (1989), D'Agostino et al. (1990), Green and Symons (1983), and Ingram and Kleinman (1989) found the coefficients of regression of the logistic regression to closely approximate those of the Cox PH model. However, with a long follow-up time, outputs from the logistic regression become biased and not reliable making the survival analysis approach a more suitable, robust, and reliable model for analysing time-to-event data.

Materials and Methods Survival Analysis Methodology

Event

An event in survival analysis means death, disease incidence, recovery, relapse, or an experience of interest that might occur to a person. It is additionally typically alluded to as a failure because it is generally some bad individual experience. However, in a situation where survival time denotes time employment after find being unemployed for some time, failure is a positive event (Kleinbaum and Klein, 2010). In the context of this study, the event of interest is the default on personal bank loans.

Survival/Failure Time (T)

The outcome variable of interest in survival analysis is the survival/failure time. This is the time from the beginning of a study or when an individual entered the study up to: i. The desired event happening, or

- ii. End of the study, or
- iii. Loss of contact with the individual or withdrawal of the individual from the study. We define the failure time random variable, T, as a nonnegative ($T \ge 0$) which may be discrete or continuous (Rahardja and Wu, 2018). In defining a random variable for the failure time, there has to be:
- 1. An unequivocal time origin. That is, the start and end periods of the study must

be very specific.

- 2. A defined duration (e.g., days, weeks, months, quarters, years). The period must be very specific.
- 3. Clearly defined event (e.g., loan default, death, relapse of disease, etc.)

Censoring

This is the phenomenon where during the period of observation, the event which defines the survival time may not be experienced by some of the people in the study. This becomes what is known as censored information, which is, the time to event for those people who have not encountered the event under study is censored (before the study ends).

Censoring may as well occur when an individual during the study period is parted with and cannot follow through with the study due to death or other situations. Finally, it occurs when an individual pulls out of the study automatically as a result of death (i.e., when the event of interest is not death) or any other factors such as a reaction negative toward (Kleinbaum and Klein, 2010). There are several types of censoring but the data used in this study is right-censored. In right censoring, the true unobserved event is to the right of the censoring time. The complete survival time interval is unknown. Thus, all that is known is that the event has not happened at the end of the follow-up or study.

Survival Function, S(t)

This is a nonincreasing function that specifies the probability that an individual survives

beyond some stated time t. It is a measure of the probability that the

survival/failure time is far ahead of some specified time t. The S(t) takes on the value of 1 at the start of the study (where t=0) and 0 as t approaches infinity

(). Theoretically, toward the beginning of a study, since nobody has encountered the event at this point, the likelihood of surviving beyond time zero is one. Also, if the study period increased without limit, eventually, everyone would experience the event, so the survivor curve must eventually fall to zero. Let T be a nonnegative random variable representing the waiting time until a customer defaults (Kleinbaum and Klein, 2010). The survival function, S(t) is given by:

$$S(T) = P(T \ge t)$$

$$= 1 - F(t)$$
(1)

where F(t) is the survival up to time t and t is any specific time value T

The Hazard Function, $\lambda(t)$

This is a nonnegative function that is greater or equal to zero ($\lambda(t)$ - 0) without an upper limit. It provides the immediate potential for each time unit for the occurrence of an event, considering that an individual has subsisted up to a certain time t. The hazard function unlike the survivor function, which centers around nonfailure, centers around failure, which is the occurrence of the event of interest (Kleinbaum and Klein, 2010). The hazard function is expressed mathematically as;

$$\lambda(t) = \frac{f(t)}{S(t)} \tag{2}$$

is the pdf while S(t) is the survival function. Between only the survival function and hazard function, a relationship may be obtained as follows:

$$= 1 - F(t)$$

$$\frac{d}{dt}S(t) = \frac{d}{dt}(1 - F(t))$$

$$S'(t) = -f(t)$$

$$\lambda(t) = -\frac{S'(t)}{S(t)}$$

$$\lambda(t) = -\frac{d}{dt}lnS(t)$$

$$\int_{0}^{t} \lambda(\mu)d\mu = -\int_{0}^{t} \frac{d}{d\mu}lnS(\mu)d\mu$$

 $S(t) = P(T \ge t)$

$$\int_{0}^{t} \lambda(\mu) d\mu = -\ln S(\mu) \Big|_{0}^{t}$$

$$-\ln S(t) + \ln S(0) = \int_{0}^{t} \lambda(u) du$$

$$\ln S(t) = -\int_{0}^{t} \lambda(u) du$$

$$S(t) = e^{\left(-\int_{0}^{t} \lambda(u) du\right)}$$
(3)

 $\lambda(u)$ is the *hazard function* while S(t) is the *survival function*.

Hazard Ratio

The hazard ratio (HR) is the ratio of the hazard for one person and the hazard for another. The two people who are analyzed

can be recognised by their qualities for the collection of explanatory variables, (Kleinbaum and Klein, 2010).

Hazard Ratio =
$$\frac{\lambda(t, X^*)}{\lambda(t, X)}$$
 (4)

Here, X^* is the explanatory variable set for the first person, while X represents that of the other person. On account of the Cox PH model, this simplifies to:

$$HR = e^{\sum_{i=1}^{p} \beta_i \left(X_i^* - X_i\right)}$$
(5)

Cox Proportional Hazard Regression This is a semiparametric method for investigating the effect of one or some predictors on the time a specified event takes to happen. Per the assumption of the Cox PH model, the Hazard Ratio associating two particulars of predictor variables is continuous over the long run (Kleinbaum and Klein, 2010). The model is usually given by:

$$\lambda(t,X) = \lambda_0(t)e^{\sum_{i=1}^{p}\beta_i X_i}$$
 (6)

Model (6) provides an equation for the hazard rate $\lambda(t,X)$, at a specified time for a person with a given specification of a set of indicators signified by X. Implying that, X denotes a vector of predictors being modelled to estimate the hazard function of a person. The Cox PH model stipulates that the hazard at any time t is the product of two quantities. The first is the *baseline hazard function*, $\lambda_0(t)$. The other is the exponential function e which is raised to the power of a linear summation $\beta_i X_i$. The summation is carried out on the p predictors (X) and p parameters (β) of the predictors. A

significant aspect of this expression concerning the assumption of the Cox PH model states that the baseline hazard is a function of time t, however, X is not included.

This X may either be a time-independent variable or vice versa. This postulation of proportional hazards in the Cox proportional hazard model is broken when the model includes time-dependent covariates which result in what is known as the extended version of the Cox model.

The Cox model's baseline hazard $\lambda_0(t)$, is an unspecified function, the very property making it semiparametric. The Cox PH is a robust model such that the findings from using it will closely approach that of the actual parametric model. The exponential part of the Cox PH model ensures that the fitted model will always give estimated hazards that are nonnegative. Hence, using minimum assumptions, the fundamental information expected from survival analysis, which is a hazard ratio and a survival curve could be obtained with the Cox PH model.

Method of estimation

Estimation of the parameters of the Cox PH model is done by partial likelihood estimation where the partial likelihood function is maximised (Cox, 1975). Partial likelihood takes into account probabilities for those people who come up short and not unequivocally factor probabilities for censored persons. Notwithstanding, survival time data before censoring is utilized for the censored persons. Meaning the one censored later than the i^{th} time of failure is essential for the hazard collection for figuring out the i^{th} probability although this subject is cut out later. Let $R(t_i)$ denote the number of counts at risk of defaulting loan at a time t_i , which represents the risk set. It implies that the probability that a j^{th} case will default at a certain time T_i is expressed as:

$$P(t_{j} = T \mid R(t_{i})) = \frac{e^{\beta X_{i}}}{\sum_{j \in R(t_{i})} e^{\beta X_{j}}}$$
(7)

The summation sign above in the denominator sums over every individual in the risk set. When we take the product of the conditional probabilities in equation (7), we obtain the partial likelihood function as:

$$L_{p} = \prod_{i=1}^{n} \left[\frac{e^{\beta X_{i}^{\cdot}}}{\sum_{j \in R(t_{i})} e^{\beta X_{j}^{\cdot}}} \right]^{\delta_{i}}$$
(8)

where n represents distinct failure times while δ_i is the failure time indicator, which is 0 if the case is censored, and 1 if the event of interest occurred. The log-likelihood function therefore becomes;

$$\log L_p = \sum_{i=1}^n \delta_i \left[\beta X_i^{\cdot} - \log \sum_{j \in R(t_i)} e^{\beta X_j^{\cdot}} \right]$$

When equation (9) is maximised, we obtain the β estimates.

The loan data

The data for the study was obtained from the headquarters of a limited liability rural bank in Ghana. The dataset for the study consists of 196 successful personal loan applicants of the bank from 1st March 2016 to 30th July 2020. Nine (9) variables are

measured on each applicant.

Table 1. Variable names, labels, and values

Name	Label	Values
Default	Default Status	0 = "No"
		1 = "Yes"
Dep	Number of Dependants	None
Edu	Educational Level	1 = "Illiterate"
		2 = "Basic"
		3 = "Post Basic"
EmpType	Type of Employer	1 = "Government"
		2= "non-Government"
Gen	Gender of the loan applicant	1 = "Male"
		2 = "Female"
Age	Age of loan applicant	None
MStatus	Marital Status	1 = "Single"
		2 = "Married"
Iss_Date	Loan Issue Date	None
Rep_Date	Last Repayment Date	None
Months	Months between Iss_Date and	None
	Rep_Date	

Results

Model Building

This study used six (6) predictors to build a predictive model for this study. Two of the predictors namely Dep and Age are quantitative variables. The other four: Edu

(with 3 levels), EmpType (with 2 levels); Gen (with 2 levels) and MStatus (with 2 levels) are categorical. The Cox PH model was fitted as displayed in equation (10) based on (6)

Equation (10)

$$\lambda(t, X) = \lambda_0(t) \exp \begin{pmatrix} \beta_{Dep} X_{Dep} + \beta_{Basic} X_{Basic} + \beta_{Post \ Basic} X_{Post \ Basic} + \beta_{Age} X_{Age} \\ + \beta_{Married} X_{Married} + \beta_{Non \ Government} X_{Non \ Government} + \beta_{Female} X_{Female} \end{pmatrix}$$

Table 2. Initial model output

n = 196, number of events = 97							
						Lower	Upper
Variable	Coef	Exp(Coef)	Se(Coef)	Z	Pr(> Z)	95% CI	95% CI
Dep	0.212	1.237	0.066	3.235	0.001**	1.087	1.407
EduBasic	-0.491	0.612	0.315	-1.557	0.119	0.330	1.135
EduPost Basic	-0.118	0.889	0.291	-0.406	0.685	0.330	1.135
EmpType Non-	0.640	1.897	0.258	2.483	0.013*	0.502	1.572
Government							
GenFemale	-0.321	0.275	0.215	-1.495	0.135	0.476	1.105
Age	-0.003	0.997	0.007	-0.373	0.709	0.984	1.011
MStatusMarried	0.028	1.028	0.216	0.128	0.898	0.673	1.570

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Concordance = 0.631 (se = 0.032)

Rsquare = 0.117 (max possible = 0.992) Likelihood ratio test = 24.450 on 7 df, p = 0.001Wald test = 22.380 on 7 df, p = 0.002Score (logrank) test = 22.960 on 7 df, p = 0.002

Coef: represents the coefficients of the model predictors, beta, which in the Cox PH model, could be interpreted as the change in the log of the hazard function for each one-unit change in a predictor, holding other predictors constant.

Concordance: measures the predictive power of the Cox PH model. A model with a concordance greater than 0.5 has good prediction ability. Similarly, a model with A concordance less than 0.5 has poor predictive ability while the predictive ability of a model with a concordance of 0.5 is no better than random chance.

Rsquare: indicates the proportion of the variance in the

data that is explained by the fitted model. A high Rsquare is preferred over a low one as high Rsquare indicate that the fitted model explains more of the variation in the data. However, the Rsquare in Cox model is highly sensitive to the proportion of censored values. The expected value of Rsquare decreases substantially as a function of

the percent censored observations. At the

latter part of the output are three tests: **Likelihood ratio test, Wald test and Score test** for testing the global null hypothesis, $\beta = 0$. These are asymptotically equivalent tests that test the hypothesis that a set of predictors have no effect.

They test the global statistical significance of the model by testing the null hypothesis that all of the coefficients of the predictors, β s, in a Cox model are zero (0).

The null hypothesis, \boldsymbol{H}_0 , and the alternate hypothesis, \boldsymbol{H}_1 , are given by:

$$H_0: \beta = 0$$

$$H_1: \beta \neq 0$$

It should be noted that for a small sample size, the Wald, score and likelihood ratio tests may differ by a small degree, but they would give similar results for a large enough sample size. The likelihood ratio test has better behaviour for small sample sizes, so it is generally preferred and therefore attention was limited to the likelihood ratio test in this study.

Test for the Significance of the Predictors

A test for the significance of the model predictors would involve testing the significance of the coefficients of the model predictors. A hypothesis test below was employed.

Null hypothesis, $H_0: \beta_i = 0$ *Alternate hypothesis*, $H_1: \beta_i \neq 0$

Where i would take one of the predictors (Dep, Basic, Post Basic, Non-Government, Female, Age, Married) at a time.

Test for the significance of Dep at a confidence level of 95%

 $H_0: \beta_{Dep} = 0$

 $H_1: \beta_{Den} \neq 0$

In Table 2, Dep has a coefficient of 0.212287 with a standard error of 0.065627. It has a hazard ratio of 1.236502 with a confidence interval of (1.0873, 1.406). The hazard ratio of 1.236502 means the predictor Dep would increase the risk of default by 23.6502%. The test statistic for testing the significance of this predictor is 3.235 with a p-value of 0.00122 which implies the null hypothesis should be rejected. Hence the predictor Dep is significant in the model. In Table 2, the variables Dep and Non-Government employer type were the only significant predictors at a 95% confidence level.

Test for the significance of the level Non-Government of EmpType at a confidence level of 95%

 $H_0: \beta_{NonGovernment} = 0$

 $H_1: \beta_{NonGovernment} \neq 0$

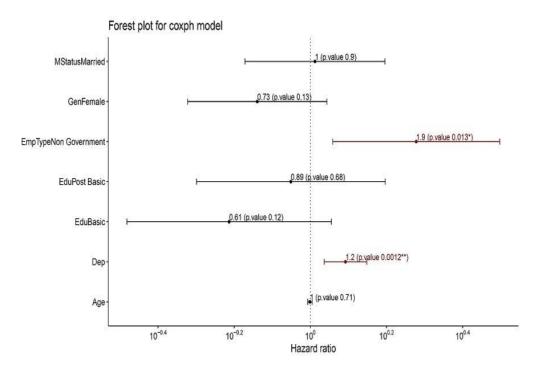
In Table 2, non-Government has a coefficient of 0.640040 with a standard error of 0.257778.

Non-Government has a hazard ratio of 1.896557 with a confidence interval of (1.1443, 3.143). A hazard ratio of 1.896557 means an individual with a non-Government as the type of Employer would increase the risk of default by 89.6557% as compared to an individual who is a government worker. The test statistic for testing the significance of this predictor (non-Government) is 2.483 with a p-value of 0.01303 which implies the null hypothesis should be rejected. Hence the predictor non-Government is significant in the model.

Testing the significance of each one of the other predictors at a 95% confidence level indicated that the predictors MStatus, Gen, Edu and Age are not statistically significant since the p-value of each one of them is greater than 0.05.

Moreover, the test statistic for the likelihood ratio test is 24.45 with a p-value of 0.0009489. Therefore, the global null hypothesis is rejected at a 5% significance level indicating that at least one of the coefficients is not zero (0). This conclusion from the likelihood ratio test confirms the observations that were made on that the predictors Dep and EmpType as significant predictors of the hazard function. The nonsignificance of some of the predictors of the model above implies a rejection of the model and therefore a new model should be built. Figure 2 is a forest plot for the Cox regression model (10).Hazard ratioestimates along with confidence intervals and p-values are plotted for each predictor.

Figure 2: First forest plot



Building of a new Model

Discarding the non-significant predictors, we focused on building a new model with

only the significant predictors. This model would be of the form:

Equation (11)

$$\lambda(t, X) = \lambda_0(t) \exp(\beta_{Dep} X_{Dep} + \beta_{Non_Government} X_{Non_Government})$$

Fitting the new model in R gives the following output:

Table 3: New model output

n = 196, number of events = 97							
Variable	Coef	Exp(Coef)	Se(Coef)	Z	Pr(> Z)	Lower 95% CI	Upper 95% CI
v ariable	0001	Emp(Goel)	86(8861)		11(2)	7570 01	7570 GI
Dep	0.191	1.210	0.063	3.012	0.003**	1.069	1.370
Non-Government	0.610	1.841	0.254	2.399	0.016*	1.118	3.032

Signif. codes: 0 '*** 0.001 '** 0.01 '* 0.05 '.' 0.1 ' 1

Concordance = 0.600 (se = 0.031)

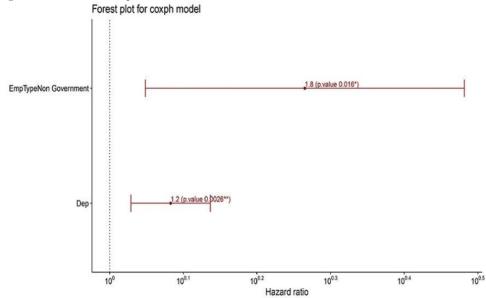
Rsquare = 0.0900 (max possible = 0.992) Likelihood ratio test = 18.390 on 2 df, p = 0.0001

Wald test = 22.380 on 7 df, p = 0.0002Score (logrank) test = 22.960 on 7 df, p = 0.0001

The concordance of the model is 0.6 indicating that the model has good

predictive power and hence could be used for making predictions. Although the model has a low Rsquare of 0.09, the Rsquare in the Cox model is affected by censored values. Thus, this low Rsquare value is expected because 49% of the observations are censored. Hence, even though the Rsquare value is low, the model still explains some of the variations in the data. Below, is a forest plot for the Cox regression model (11).

Figure 3: Second forest plot



Tests for the Validity of the new Model Three tests, a test for proportionality of the hazard ratio, a test for influential observations, and a test for linearity of the

conducted to test the validity of the final model.

parametric part of the cox model would be Table 4. Test for proportionality

	rho	chisq	р
Dep	0.153	2.063	0.151
ÈmpType non-Government	0.018	0.034	0.854
GLOBAL	NA	2.202	0.333

The null hypothesis, H_0 , and alternate hypothesis, H_1 , for testing the proportionality of Dep is given by:

 H_0 : The Hazard ratio of Dep is constant

 H_1 : The Hazard ratio of Dep is not constant

That of EmpType is given by:

 \boldsymbol{H}_0 : The Hazard ratio of EmpType is constant

 $oldsymbol{H_1}$: The Hazard ratio of EmpType is not constant

A global test of proportionality for the model is given by:

 $oldsymbol{H}_0$: All the predictors of the model have constant hazard ratios

 $oldsymbol{H}_1$: At least one of the predictors of the model does not have a constant hazard ratio

Results from Table 4 indicate that the test for proportionality of Dep returned a test statistic of 2.063 with a p-value of 0.151. The null hypothesis could not be rejected. Hence, Dep satisfies the proportional hazards assumption. Also, the test for proportionality of EmpType returned a test statistic of 0.034 with a p-value of 0.854. The null hypothesis could not be rejected. There is therefore strong evidence of proportional hazards for EmpType. Finally, the global test for proportionality returned a test statistic of 2.202 with a pvalue of 0.333. Thus, the null hypothesis could not be rejected which goes to confirm that the two predictors satisfy the assumption of proportionality. A graphical assessment of the proportional hazards assumption to verify the results of the above test which involves plots of scaled **Schoenfeld** residuals against time for each predictor in the model would yield:

In a scaled Schoenfeld graph, systematic departures from a horizontal line are indicative of nonproportional hazards. That is, a non-zero slope is an indication of a violation of the proportional hazard assumption. Graphically, the assumption of proportional hazards appears to be supported by the two predictors (Dependents and EmpType) used in the model.

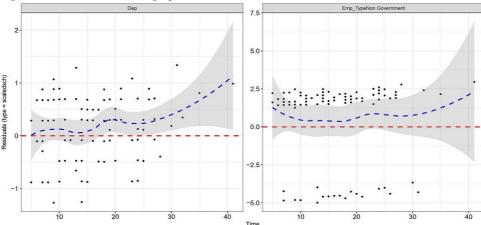


Figure 4: Scaled Schoenfeld graphs

This is because the slopes from their respective scaled Schoenfeld graphs are not significantly different from zero (0). This effect was also detected in the test reported above. Hence the rejection of the null hypothesis.

Test for influential observations

As part of assessing the validity of the model fit, checks are made to find the presence of influential observations. A plot of dfbetas would be used for this task. dfbetas is a measurement of how much effect every observed value has on a specific predictor. For a predictor and an observed value, the dfbetas is the difference between the coefficient of regression computed for the entire dataset and the one computed with the deleted observation, scaled by the standard error calculated with the deleted observation.

The threshold for *dfbetas* is
$$\left| \frac{2}{\sqrt{n}} \right|$$
, where n

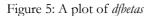
represents the total number of observations. In this study n = 196, which when evaluated gives a *dfbetas* cut-off of 0.1428571429. A plot of *dfbetas* to help

with the analysis is as below:

Comparing the magnitudes of the dfbetas values to the dfbetas cut-off (0.1428571429) suggests that some of the observations are influential. Checks with the bank indicate that these observations are correct and so the presence of influential observations is ignored.

Test for linearity

In this section, the deviance residuals plot is examined to detect nonlinearity. This is done to ensure that the parametric part of the model is correctly specified. Deviance residuals are defined as a martingale residual and an event variable transformation. The martingale residual of an individual specifies excess failures beyond the expected baseline hazard. Deviance residuals are often symmetrically distributed around zero and have a standard deviation of 1.0. Non-linearity is not an issue for categorical variables (EmpType in this case) and so the focus of this analysis is on quantitative variables (Dep in this case). The deviance residuals plot obtained in R is displayed in Figure 6.



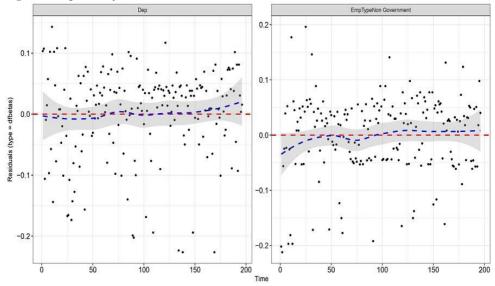
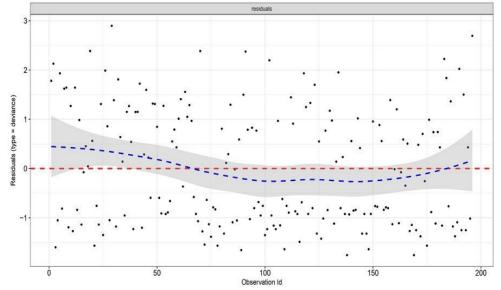


Figure 6: Deviance residuals plot



In a test of linearity, the more the deviance residuals plot is close to a zero line, the more the non-linearity can be excluded. From the plot, it appears nonlinearity, is

slight here. That is, the parametric part of the model has been correctly specified and fulfils the assumption of linearity. Final Model of the Study

The final model of the study after going through all the necessary procedures of

fitting

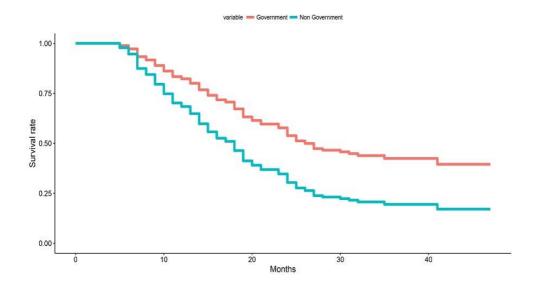
a Cox PH model is (11). Substituting the values of the coefficients would give:

$$\hat{\lambda}(t, X) = \hat{\lambda}_0(t) \exp(0.19083X_{Dep} + 0.61040X_{Non_Government})$$
 (12)

Adjusted Survival Curves

Having fit a Cox model to the data, the estimated distribution of survival times for each level of EmpType adjusted for the effect of Dep is examined. These survival curves show how having Government as

one's employer or having an employer that is non-Government influences survival estimated from (12). The plot of the adjusted survival curves is displayed in Figure 7.



It is observed from Figure 7 that government employees consistently have higher survival probabilities than non-government employees after adjusting for Dep. Furthermore, the difference between government and non-government appears to widen over time.

Discussion

Much works has been done to find macroeconomic and bank specific determinants of NPLs. The current study applied the Cox PH model on microeconomic variables in establishing the link that exists between the risk of default and its predictors. Results show that level of education, gender, age as well as marital status of a loan applicant does not significantly affect their risk of defaulting. These current findings are in contrast to the results of Fhatuwani and Karabo (2013) who presented on the application of survival models to analyse default rates on bank loans at the Convention of Actuarial

Society of South Africa. They found all the insignificant variables noted here among others to be significant factors influencing default rate of loans. Boateng and Oduro (2018) likewise found educational level, type of loan, adequacy of the loan facility, duration for repayment of loan, number of years in business, cost of capital and period within the year the loan was given to have a significant effect on default of student loan. Earlier studies like Volkwein and Szelest (1995) also found that obtaining scientific and technological skills as well as getting and staying married thus being married, increases the likelihood of loan repayment. In this study, however, the predictors; number of dependants of an applicant, and the type of employer of the borrower, whether government or non-government, have a significant relationship with the risk of default. Fhatuwani and Karabo (2013), Agbemava et al. (2016), and Volkwein and Szelest (1995) also found the number of dependents significant factor of default. It was observed that holding employer type constant, the risk of default of a borrower would increase by 21.025% for any additional dependant the borrower takes on. A borrower with non-government employer type has 84.118% risk of default compared to a borrower with the government as the employer type when number of dependents was held constant.

Recovery Program to buy NPLs to enable the banks to resume lending Herd-Clark and Murty (2013), nor that of Nigeria where the Central Bank had to set up the Asset Management Corporation of Nigeria (AMCON) which sought to buy NPLs on the books of the banks that were at risk Akpan (2013), it is important that policy makers and managers of banks adhere strictly to the laws regulating the financial and banking sector especially on the issues of NPLs. The government and monetary policy authorities must also collaborate actively with the financial sector players to monitor and improve the control of access to the limited investment funds and personal loans. The insight gained from the successful application of the Cox PH model to a small sample of personal loan data in this study makes the belief that statistical modelling is robust to help understand and correct processes and occurrences in the banking industry especially in the area of predicting which clients are more liable to default their loans based on their demographic characteristics. More research should be carried out in applying statistical modelling to banking processes. Further studies are recommended in comparing the robustness of the survival models with the Generalised Logistics Regression, common model in predicting loan default in the Ghanaian banking sector.

Conclusion

Although Ghana's NPL ratio has not reached such crisis level as encountered by America during the Obama administration where they had to set up the Trouble Assets

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Investigating the Determinants of Consumer Attachment to Third Places

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Abstract:

This paper examines the determinants of consumer attachment towards third places. The study explores the determinants of consumer attachment to third places to establish factors influencing consumers' decision to continue visiting and patronising third places. The study hypothesised that perceived quality, perceived value, trust, reputation, and perceived risk, significantly and positively influenced customer behavioural intentions and attachment to third places. The study again hypothesised that perceived risk was significantly but negatively related to customer attachment to third places. PLS-SEM was used to analyse data collected from 183 respondents. The results indicate that perceived quality, perceived value, trust, and reputation had a positive and significant relationship with behavioural intentions and attachment to third places, except perceived risk, which had a negative but significant relationship with customer attachment to third places. Future studies can examine moderating factors that could influence third-place attachment factors. This study makes a valuable addition to the literature on third places, offering insights into the nature of third places and factors driving consumer attachment to them..

Key words: Consumer, Attachment, Third Places, Determinants. Ghanal

Introduction

Consumers of the 21st century have had to contend with rapid change, globalisation, and technological advancement, which have affected all aspects of human activity and well-being (Sharma et al., 2021; El-Said & Aziz, 2022). The rate of change in the past decade has been phenomenal and unprecedented. Changes in consumption patterns, innovations in technology and service delivery by firms have all been changes consumers have had to embrace and adapt to (Sigala, 2020). Globalisation and increased population

https://dx.doi.org/10.4314/aj mr.v28i2.6 have also affected urban planning and development, and consumers have had to contend with the changes that come with some of these developments (Kanai et al., 2018; Fix & Arantes, 2022). These factors could cause stress in people. Many factors account for stress among individuals and families (Brown et al., 2020). The COVID-19 pandemic, which affected society at all levels, exacerbated the situation (Yıldırım & Solmaz, 2020). The ill effects of COVID-19 on individuals' psychological, physical, and emotional well-being have been documented (Park et al., 2020). The emergence of the pandemic disrupted the hospitality, travel, and tourism industry, affecting not just global tourism but also local tourism (Duro et al., 2021). Due to the pervasive nature of the COVID-19 pandemic, governments worldwide issued orders shutting down businesses and places which meant that third places also had to be cordoned off to the public (Qiu et al., 2020). During this lockdown period, society appreciated the relevance and essence of third places.

Third places are places of interest, often in central public places that are easily accessible to people, where events, hangouts, and gatherings occur (Williams & Hipp, 2019; Fong et al., 2021). Third places play a significant role in people's lives. They offer individuals, families, and groups a place for respite, interaction, and escape from work stress and other social commitments (Dolley, 2020). The literature distinguishes third place from home, officially classified as the "first place" (Oldenburg & Brisset, 1982; Hanks et al., 2020). Third places are classified as places that facilitate and promote interactions and have become essential to place management (Cantillon & Baker, 2022). The literature on third places has, over the years, addressed several issues

such as the promotion of sustainable relationships (Sugiyama, Shirahada & Kosaka, 2015), interaction and cohesion in the context of neighbourhoods (Williams & Hipp, 2019), and outdoor behaviour systems (Ren, Wang, Liu & Wang, 2017). Despite these studies, significant questions remain concerning factors determining people's attachment to third places (Hanks et al., 2020). Crick (2011) attempted to investigate the opportunities maximising the potential of third places and found that managers of third places needed implement strategies to develop consumer attachment to third places. Lestari and Sumabrata (2018) considered factors that lead to attachment neighbourhoods, linking them to family, physical, economic, and social factors. Urban studies researchers examined characteristics that influence attachment to third places focusing on affective and "psychological ownership" ties to the place (Marques & Aleixo, 2021; Joo, 2020; Hickman, 2013). Researchers have also noted the supportive social role of third places, arguing that it promotes attachment to these facilities (Mimoun & Gruen, 2021; Luca & Pegan, 2014; Lin, 2012; Rosenbaum et al., 2007 & 2006; Milligan, 1998). Consumer attachment is a vital marketing outcome that can benefit service providers and brands (Brocato, Baker & Voorhees, 2015). Third places act as hubs for social interaction, community engagement and relaxation for individuals seeking to unwind from stress and its associated effects (Mehta & Bosson, 2010).

Investigating the determinants of consumer attachment to third places is relevant, given the role third places play in society (Yuen & Johnson, 2017). Brown and Perkins (1992, p. 284) argue that "place attachment involves positively experienced bonds,

sometimes occurring without awareness, that is developed over time from the behavioural, affective, and cognitive ties between individuals and or groups and their sociophysical environment." The concept of attachment is an emotional feeling that people have which makes them patronise a place, product, or service (Scannell & Gifford, 2017). It is reasonable to suggest that determining the factors that influence consumer attachment to third places is vital influencing behavioural intentions towards the patronage of third places. Though scholars such as Cabras and Mount (2017) have hinted that third places are crucial in economic development, social capital and community well-being, little attention has been paid to what factors can contribute to greater patronage and loyalty to third places. This study seeks to contribute to the discourse on third places identifying factors determining consumer attachment to third places and how they impact behavioural intentions. This study examines factors that affect consumer behavioural intentions towards third-place locations. The study investigates the role of five factors that influence consumer behavioural intentions. specifically patronage, recommendations, and loyalty. Perceived value, perceived risk, trust, reputation, and product/service quality are the five determinants of consumer behavioural intentions towards third places proposed in this study. Hence this study aims to measure the influence of these variables on consumer behavioural intentions towards third places.

Literature Review, Conceptual Framework and Hypotheses Development

Third Places

The concept of Third Places was developed by Oldenburg (1989), a sociologist who observed that individuals spent time in other places besides home and work. Oldenburg (1989, p.2) described third places as "...a setting beyond home and work." He further explained that home was the "First place" where people spent most of their time, followed by work, which he classified as "Second place" (Oldenburg, 1989). Since the term emerged, other scholars have tried to investigate its conceptual underpinnings and gain more insight into the nature and characteristics of third places. For instance, Oldenburg and Brissett (1982) identified third places as public locations where residents inhabitants of a geographical frequently gather to socialise. Third places characterised by food, landscape, and other amenities, which encourage socialisation (Tan & Lee, 2022). Over the years, researchers have found that individuals patronise third places due to the benefits of visiting such places (Elshater, 2018; Biglin, 2021). Biglin (2021) found that third places have a therapeutic effect on visitors, leaving them refreshed and willing to visit again due to the perceived benefits. Finlay et al. (2019) claimed that third places had holistic benefits for the health and wellbeing of individuals, a fact that place managers and city council officials should not underestimate. Williams and Hipp (2019) claimed that third places enhance individuals' well-being and deepen social relationships, such as the interaction between neighbours and individuals in a particular geographic area.

According to Oldenburg (1990; 2001), third places attract individuals seeking regular and informal conversations and interactions with like-minded individuals. Third places can thus be described as the neighbourhood space for social relaxation and everyday interactions: a bridge between

home and work and a haven for relaxation and enjoyment (Vaux & Asay, 2019). A review of the extant literature suggests that third places comprise but are not limited to bars, restaurants, parks, gardens, and corner bodegas, to name a few (Rosenbaum, Essentially, geographical 2006). any location that hosts people in a relaxed and informal setting can be described as a third place. In this study, some determinants of consumer attachment to third places are explored because third places have become so significant that some people cannot live without them and have developed some passion for them (Purnell, 2019). Hanks et al. (2020) found that place attachment moderated the relationship perceived similarity to other customers and consumer behavioural intentions, precisely attitude and loyalty. In this study, we explore the determinants of consumer attachment to third places to establish factors influencing consumers' decision to continue visiting and patronising third places.

Place Attachment

Place attachment has emerged as an essential concept in the tourism management literature (Dwyer et al., 2019). Researchers have found several factors accounting for consumers' attachment to places (Clarke et al., 2018; Moulay et al., 2018). Social interaction and attachment to places mainly for socialising can often provide stability in human life, especially when it enhances the ability to function and perform daily duties. The effect is unique to individual consumers/employees, reflecting actual experiences at the location. Consumer loyalty develops when the intrinsic experiences and reasons for participation become a need that influences behaviour toward the place. Many service providers may not even really understand

the fundamental importance of these third places to consumers. The concept of Third Places has taken on a more significant role in people's way of life. It is no longer a recreational activity but an integral part of the consumer lifestyle (Zhang et al., 2019). Since consumers behave positively to satisfying experiences, 'Third' places tend to play a strategic role in the well-being of both employees and customers. Even though there is a growing number of academic studies on third-place attachment (Hanks et al., 2020; Lewicka, 2011; Hawkings & Ryan, 2013), none of the previous research has focused on the effect of the emanating factors on consumer behavioural intentions. This study seeks to examine five antecedents of consumer attachment to third places.

Perceived Quality and Behavioural Intentions

Consumers have been biased toward products they perceive to be high quality (Muskat et al., 2019). Quality products drive consumer patronage more than any single factor (Su et al., 2018; Hallak et al., 2018). Perceived quality has therefore become an factor that influences essential behaviour of consumers (Kim et al., 2018). Extant literature hints at the link between perceived quality and consumer behavioural intentions towards places of relaxation and socialisation (Dolley, 2020; Hanks et al., 2020). For example, the study by Tsai (2015) explored the nexus of relationships between perceived quality, place attachment, tourist satisfaction and post-visiting behavioural intentions. The conclusion from Tsai (2015) is that the quality perception individuals attach to a place can determine whether they will return to visit the place.

Similarly, Marcheschi et al. (2015) found

that people's perceptions of the quality of a place can lead them to develop a sentimental attachment to the place. Recently, Marcheschi et al. (2022) sought to determine the link between perceived quality of life and neighbourhood attachment. They discovered they were related and influenced consumer behavioural intentions and attachment to places. Other studies have also found merit in the argument that perceived quality influences place attachment behavioural intentions towards a place (Kim et al., 2018). Consequently, we theorise that the quality of products and services in a third place can be an instrument in stimulating consumer interest and the development of attachment to the place. Given the above, the following hypothesis is proposed:

H1: A positive and significant relationship exists between the quality of the product/service of a third place and behavioural intentions and attachments to third places.

Perceived Value and Behavioural Intentions

Perceived value refers to consumers' perceptions of a product's or service's expected performance (Sweeney & Soutar (2001). Perceived value is the mental image that consumers have about the ability of a product or service to satisfy their needs (Dedeoğlu, 2019). Scholars have confirmed that perceived value is an essential factor influencing consumer behaviour (Caber et al., 2020). Ganji et al. (2021) explored the perceived value of resident attachment. They found strong evidence of a significant relationship between perceived value and behavioural intentions towards places. Other studies similarly found that perceived value is an essential antecedent of place attachment (Wang et al., 2011; Butler, 2016). Therefore, the perceived value of a third place determines whether individuals will keep visiting these places, return, and recommend them to other family and friends (Um & Yoon, 2021). When individuals in a community perceive that a third place offers them an escape from home and work, they will likely develop some attachment to the place over time and subsequently develop positive behavioural intentions (Ganji et al., 2021). This study hypothesises that:

H2: A positive and significant relationship exists between the perceived value of a third-place location and consumer behavioural intentions and attachment to third places.

Trust

In the marketing and consumer behaviour literature, trust has been an important element in determining consumer response to a product, service, or brand (Narteh et al., 2013; Van Tonder & Petzer, 2018). essential in developing relationships between consumers and organisations (Morgan & Hunt, 1994), and this argument can be proffered in this study. Trust represents the degree to which an individual has confidence in the reliability and integrity of a service provider or partner (Morgan & Hunt, 1994). Third places offer residents of a community and individuals an opportunity to meet, interact and socialise. This comes with other hospitality organisations' functionality, such as serving food and drinks and running bar services for patrons (Mikunda, 2004). In the hospitality industry, trust is a component determining consumer behavioural intentions possible future behaviours (Ouyang et al., 2017). Trust can enhance a relationship much as its lack can deteriorate it. (Narteh et al., 2013). The above implies that trust can be a critical antecedent of consumer attachment to places. If consumers perceive third places offer credible services and consistently meet their expectations, they will likely become attached to them. This, therefore, implies that:

H3: There is a positive and significant relationship between trust for a third-place location and behavioural intentions and attachment to third places.

Reputation

The reputation of a place is a strong predictor of consumer behavioural intentions towards the place (Su et al., 2020). Johnson and Grayson (2005) also confirmed that "place reputation" directly impacts tourists' intentions and attitudes toward a place. This study argues that reputation can predict and determine consumer attachment to a third place. A good reputation can result in positive intentions from consumers to continually visit and recommend to family and friends (Su et al., 2020). The literature has strong arguments suggesting that place reputation influences behavioural intentions (Darwish & Burns, 2019; Hassan & Soliman, 2021). These same arguments can be extended in the context of third places, given that third places are recreational spots and share similar attributes with tourist destinations. Consequently, as destination reputation can predict behavioural intentions, a similar argument can be advanced to the extent that the reputation of a third place can positively impact consumer behavioural intentions and attachment to the place. Given this, the following hypothesis is advanced:

H4: There is a positive and significant

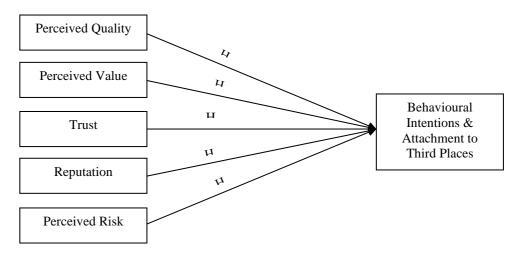
relationship between the reputation of a third-place location and behavioural intentions.

Perceived Risk

The study proposes perceived risk as a determinant of consumer behavioural intentions and attachment to third places. According to Cai et al. (2022), perceived risk determines whether consumers will react favourably to a place. Scholars have identified perceived risks to include financial, psychological, social, performance, and physical (Huifeng, Ha & Lee, 2020). These risks affect consumer behavioural intention and determine whether individuals develop an attachment to a place. The extant literature is replete with various studies highlighting the role of perceived risk in influencing consumer behaviour (Ali & Ali, 2021; Mortimer et al., 2020). The higher the perceived risk, the less favourable consumers are to elicit desired behaviours towards a place (Lu et al., 2016). On the contrary, scholars claim that the lower the perceived risk, the greater the opportunity for consumers to exhibit positive behavioural intentions (Martins et al., 2014). Thus, the following hypothesis is proposed:

H5: Perceived risk of a third-place location will be negatively related to behavioural intentions.

Figure 1: Conceptual Model



Methodology

A quantitative research approach was adopted to investigate the determinants of consumer behavioural intentions attachment to third places. Respondents were sampled from third places in Accra, where people socialise, interact, wine, and dine (Jeffres, Bracken, Jian, and Casey (2009). The respondents were selected based on their availability and willingness to participate, provided they had visited the place on at least three other occasions. A total of 20 third places were purposively selected. A third place was considered relevant for the study if it existed for at least three years, which was adequate for patrons to have an opinion of the place. Accra is a cosmopolitan city and Ghana's national and economic capital. The researchers believe that participants from Accra are reasonably reflective of the country. A structured questionnaire was designed and administered respondents. questionnaires were given to respondents who completed them and returned them to the researchers. Responses were captured on a 5-point Likert scale consisting of 1

(strongly disagree), 2 (agree), 3 (neither agree nor disagree), 4 (disagree), and 5 (strongly disagree). The responses were picked from a sample size of 200 participants. After examining the data and screening for missing data, 183 responses were suitable for data analysis using PLS-SEM. Scholars have opined that PLS-SEM is ideal for analysing data from smaller sample sizes due to its bootstrapping approach (Hair et al., 2019). PLS-SEM was therefore adopted to analyse the data.

Measures

The measurements used in this study were adopted from other studies measuring the various constructs: perceived value, perceived risk, trust, reputation, and product/service quality. The items and the source of scales used in measuring them are presented in Table 1.

Table 1: Source of Scales Used in Measuring Items

Concept	Items	Source	Context of Study
Perceived Quality Product/Service	4	Muskat et al. (2019)	This study examined tourists' dining experiences and tested competing model predictors of satisfaction and behavioural intentions. The study examined the influence of service quality, quality of the environment, food quality, price fairness, authenticity, and tourist satisfaction on
Perceived Value	3	Chen and Chen (2010)	behavioural intentions. This paper examined the visitor experience of heritage tourism. The paper investigated the relationships between the quality of those experiences, perceived value, satisfaction, and behavioural intentions.
Trust	3	Chen et al. (2019)	The study developed a model linking perceived greenwashing, green trust, intention to revisit, intention to participate, and intention to spread negative word of mouth, based on Attribution Theory and Trust-Based Marketing Theory.
Reputation	3	Tavitiyaman and Qu (2013)	The study examined the influence of destination image and overall satisfaction toward the behavioural intention of travellers to Thailand.
Perceived Risk	4	Lu et al. (2016)	This study applied the Theory of Planned Behaviour (TPB) as a framework and perceived risk as a moderator to explore international students' intention to participate in leisure travel activities while staying in Taiwan.
Behavioural Intentions	4	Prayag and Ryan (2012)	The article evaluated a theoretical model based on hypothesised relationships among four constructs: destination image, place attachment, personal involvement, and visitors' satisfaction as antecedents of loyalty.

Data Analysis

The Statistical Package for Social Sciences (SPSS) was used for data entry screening. During the data screening process, it was found that out of the 200 questionnaires distributed, 17 instruments were either incomplete or poorly completed. The

usable questionnaires were analysed, constituting about 92% of all questionnaires administered. A test for common method bias was conducted using Harman's (1967) one-factor test. Additionally, a test for the normality of data distribution was undertaken. This study

followed the approach Lings and Greenly (2010) adopted by conducting tests for Skewness, Kurtosis, Komogorov-Smirnov, and Shapiro-Wilk test. Skewness and Kurtosis should be zero for a data set to be normally distributed, and the Komogorov-Smirnov and the Shapiro-Wilk test should not be statistically significant. These were done with the help of IBM SPSS version 20 software, and it was found that there was no common method bias, and the data was also normally distributed. The profile of the respondents is presented in Table 2.

Measurement Model Analysis

The measurement model was estimated using Smart PLS, and the six constructs were modelled. The choice of the Smart PLS software was predicated on its reliability in handling smaller sample sizes and transforming non-normal data during the estimation process, unlike in the case of covariance-based SEM (Hair et al., 2014). Partial Least Squares (PLS) was performed using SmartPLS version 3.2.7. Researchers have found that PLS is suited for predictive models using much smaller or much larger samples (Chin, 1998; Hair et al., 2011) and the preferred approach is when assumptions of normality are not satisfied (Chin & Newstead, 1999). The significance of each path was tested using bootstrap tvalues (5000 sub-samples) (Tortosa et al., 2009), and this information is available in Table 4.

Validity and Reliability Analysis

The latent constructs were examined using Fornell and Larcker's (1981) recommendation. They suggested that the Average Variance Extracted (AVE) for each variable needed to be compared to the shared variance between the constructs in testing for validity. The recommended

threshold for testing for convergent validity is when AVE values are greater than 0.50 and Composite Reliability (CR) values are greater than 0.70 (Fornell & Larcker, 1981; Hair et al., 2014). In this study, all the AVE results obtained were greater than 0.50, whilst the CR values were also all above 0.70, thus confirming convergent validity as illustrated in Table 2. In testing for discriminant validity, the AVE values were assessed to determine whether they were greater than the square of the correlations. The results from Table 3 indicate that the AVE values are greater than the square of the inter-item correlations, thus confirming the discriminant validity of the constructs (Hair et al., 2014; Hair et al., 2019). Recent research on variance-based structural equation modelling has suggested that the Fornel and Lacker (1981) criterion alone is not conclusive on discriminant validity (Henseler et al., 2015; Osei-Frimpong, 2017). As a result, the correlations' heterotrait-monotrait ratio (HTMT) was assessed using a specificity criterion rate of 0.85 (HTMT0.85). The results presented in Table 4 show that none of the correlations exceeded 0.85. As a result, the six-construct model demonstrates discriminant validity.

Table 2: Profile of Respondents

Variables	Frequency	Per cent
Gender		
Male	116	63.4
Female	67	36.6
Age group		
Less than 16 years	1	0.5
16-25yrs	28	15.3
26-35yrs	110	60.1
36-45yrs	39	21.3
46-55yrs	5	2.7
Educational level		
Junior High School or lower	3	1.6
Senior High School	65	35.5
College or equivalent	36	19.7
Bachelor's Degree	68	37.2
Master's degree or higher	11	6
Occupation Status		
Full-time student	46	25.1
Unemployed	5	2.7
Employed	132	72.1
Occupation		
Professional, managerial, or skilled manual worker	30	16.4
Junior professional, managerial, or skilled manual worker	59	32.2
Semi-skilled and unskilled manual worker or casual worker	54	29.5
Non-Response	40	21.9
Income group		
Nil	28	15.3
Below GHC1000	41	22.4
1001-3000 GHC	50	27.3
3001-5000 GHC	5	2.7
Refused to answer	55	30.1
Non-Response	4	2.2
Total	183	100.0

Table 3: Reliability and Validity Tests

Factor	Item code	Loadin g	t-value (Bootstra p)	CA	Composite Reliability	AVE
Quality of Products /Services	qua1	0.748**	16.647	0.657	0.814	0.593
	qua2	0.777**	18.860			
	qua3	0.784**	22.009			
Perceived Value	pv1	0.781**	20.984	0.736	0.850	0.654
	pv2	0.841**	35.314			
	pv3	0.803**	11.564			
Trust	tr1	0.655**	7.297	0.602	0.752	0.503
	tr2	0.771**	13.330			
	tr3	0.697**	8.561			
Reputation	rep1	0.864**	37.917	0.721	0.877	0.781
	rep2	0.903**	53.013			
Perceived Risk	pr1	0.698**	7.627	0.712	0.818	0.533
	pr2	0.888**	39.269			
	pr3	0.689**	7.416			
	pr4	0.619**	6.829			
Behavioural Intentions	bi1	0.712**	13.418	0.759	0.848	0.583
	bi2	0.724**	13.522			
	bi3	0.860**	41.503			
	bi4	0.750**	17.227			

Note: **t-value is significant at 0.01 level of significance; Items deleted during CFA: qua4 and rep3

Table 4: Discriminant Validity (Square root of AVEs in bold

diagonal	

Factor	Fornell-Larcker Criterion					Heterotrait-Monotrait Ratio (HTMT)						
	1	2	3	4	5	6	1	2	3	4	5	6
1. Quality of Products/ Services	0.77											
2. Perceived Value	0.56	0.81					0. 80					
3. Trust	0.45	0.43	0.71				0. 79	0.69				
4. Reputation	0.49	0.53	0.35	0. 88			0. 69	0.73	0. 57			
5. Perceived	-	-	-0.33	-	0.		0.	0.45	0.	0.488		
Risk	0.46	0.33		0. 36	73 0		66		55			
6. Behavioural	0.61	0.54	0.45	0. 52	- 0.	0. 76	0. 85	0.71	0. 73	0.697	0.60	
intentions					47							

Structural Model Analysis

Having confirmed the psychometric properties of the scales used, the next stage of the analysis entailed an examination of the structural model to assess the model's explanatory power and the significance of the hypothesised paths (Lings & Greenly, 2010). The model's predictive accuracy (R2) showed that quality, perceived value, trust, reputation, and perceived risk explained about 50% of the variance in behavioural intentions exceeding moderate level of 33% suggested by (Chin, 1998) for good explanatory power. In addition to the R2, this study utilised crossvalidated redundancy (Q2), a blindfolding procedure, as a criterion for predictive relevance (Chin, 2010) of the endogenous variables. Q2 -a value of 0.267 was obtained for behavioural intentions greater than 0, showing predictive relevance (Fornell & Cha, 1993; Chin, 2010). Finally,

the effect sizes (f2) computed for the exogenous variables showed that all the exogenous variables had small effect sizes on behavioural intentions. The results of the predictive accuracy (R2), predictive relevance (Q2) test and effect sizes (f2) are presented in Table 5.

The structural model with beta coefficient values for the parameters is indicated in figure 1. The beta value for perceived quality (0.287), perceived value (0.165), trust (0.133), and reputation (0.181) show a positive relationship with behavioural intention and indicate their relative importance concerning the independent variable. However, the negative beta value between perceived risk (-0.176) shows an inverse impact.

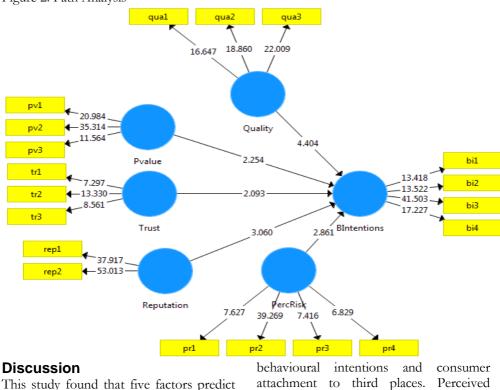
Table 5: Predictive Accuracy (R^2), Predictive Relevance (Q^2) and Effect Sizes (ℓ)

Constructs	\mathbb{R}^2	Q^2	f²(Behavioural Intentions)
Quality of Products/Services	_	_	0.09(Small)
Perceived Value	_	_	0.03(Small)
Trust	_	_	0.03(Small)
Reputation	_	_	0.04(Small)
Perceived Risk	_	_	0.07(Small)
Behavioural intentions	0.501	0.267	_

The analysis results in the structural model are presented in Figure 1. All paths are statistically significant. As a result, all the study hypotheses are supported in the present context. Specifically, a positive and significant relationship exists between quality and behavioural intentions, perceived value and behavioural intentions,

trust and behavioural intentions, and reputation and behavioural intentions. On the other hand, a significant negative relationship exists between the perceived risk associated with a third-place location and behavioural intentions. This is illustrated in Figure 1.

Figure 2: Path Analysis



perceived value, reputation; were found to have a positive and significant relationship with the dependent variables (behavioural intentions and attachment to third places), except perceived risk, which had a significant and negative impact on the outcome variable hypothesised. Perceived quality has predominantly been antecedent and determinant of behavioural intentions in the hospitality sector, and the findings of this study confirm previous works by Kim et al. (2018). Other studies have similarly found that perceived quality significantly impacts behavioural intentions (Su et al., 2018; Hallak et al., 2018). This backs up the findings of this study and establishes perceived quality as determinant of consumer behavioural intentions and attachment to third places. This study also found a positive and significant effect between perceived value and behavioural intentions. This confirms existing studies and highlights perceived value's critical role in stimulating consumer and loyalty to hospitality organisations and places (Caber et al., 2020; Ganji et al., 2021).

Trust was examined as another determinant of consumer behavioural intention and attachment to third places, and a significant and positive impact on behavioural intentions was found. This again confirms the theory by Morgan and Hunt (1994), which established that trust was a critical factor that triggers positive customer Previous behaviours. studies suggested that trust plays a crucial role in facilitating revisits from patrons of third places (Kim et al., 2009; Sirimongkol, 2022). In this study, trust was also found to have a positive and significant relationship with behavioural intentions and consumer attachment to third places, suggesting that

trust is a vital component in the service delivery process at third places and can facilitate the development of relationships between consumers and third places. Interestingly, this study also found that reputation was a predictor of consumer behavioural intentions in the context of third places. Data analysis showed a significant positive relationship between reputation, behavioural intentions, and attachment to third places. This reinforces established notions in the literature, which argues that the reputation of a place, especially hospitality organisations or third places, is vital to consumer perception and behavioural intentions (Huifeng et al., 2020; Hassan & Soliman, 2021).

Finally, this study confirmed that perceived negatively affects behavioural intentions and attachment to third places. This continues the current debate on the role of perceived risk in influencing behaviour (Huifeng et al., 2020; Huifeng & Ha, 2021). Previous studies have also observed that the greater the perceived risk, the less likely consumers are to patronise a product or service (Jeon et al., 2020). These findings have contributed to the literature third places by revealing five determinants influencing consumer response and attachment to third places. Perceived quality, perceived value, trust, reputation, and perceived risk have all been related significantly to consumer behavioural intentions and attachment to third places.

Managerial Implications

The findings of this study offer some perspective to managers of third places. The study identifies factors influencing consumers' behavioural intentions and

attachment to third places, providing invaluable insights for management and researchers. The key factors can be translated into marketing strategies, market segmentation and service improvement programmes. Third places are places of social interest and interaction, and as such, the quality of the environment, food and drinks needs to be the priority of management. It has been established through this study that perceived quality influences behavioural intentions and attachment to third places. Therefore, managers of such places need to prioritise service quality in beverages, food, and ambience. It was also observed that perceived value was crucial in determining consumer behavioural intentions. Managers of third places need to invest in their facilities and service delivery processes to ensure that customer perception is always positive. Quick service recovery strategies must be implemented to ensure that customers can be placated to pacify them and restore their perception of value in a service failure.

Following the findings of this study, management of third places need to guard their reputations by engaging customers, offering them an avenue for feedback and complaints, and ensuring that customer service issues are handled professionally to avoid lousy publicity, especially in the era of social media. Furthermore, it is imperative to examine security at third places and other factors that can increase perceived risk to prevent a negative correlation and brand association between the place and consumers. The management of third places also needs to ensure that customers receive value for money whenever they

spend on food, drinks, or other services. Finally, the findings of this study suggest that it is vital for managers of third places to ensure that staff are familiar with customers and their orders, preferences, and seating locations. Advanced booking services and reservations must be established for exclusive members who frequent. This will help to guarantee their satisfaction and continuous patronage.

Theoretical implication

Theoretically, this study expands the literature on the factors that serve as variables for consumers' intention and attachment to third places to aid in building theory. The study's findings and discussions strengthen the association between customer attachment to a facility and revisiting intention. Finally, developing a conceptual model for third-place revisit and behavioural intention calls for more empirical studies to test the factors in different settings, especially the digital space.

Directions for Future Research

The study identified and empirically tested five determinants of consumer attachments to third places and their significant relationship with third places. Future studies could look at the moderating effect of demographic variables such as gender and age on the relationship between these five determinants discussed in this study and attachment to third places. The sample size limits the study. Future studies can expand the scope and employ longitudinal methods.

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Supply Chain Management Integration and Value Creation among Ghanaian 3-Star Hotels in the Bono Region

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Abstract

In today's global smart world and digital information age, supply chain management integration (SCMI) and collaboration in the hospitality industry is of critical importance in achieving value creation and efficiency. The Importance of an integrated supply chain management (SCM) influence on services rendered and the resulting impact in creating value for businesses in the value chain is a known phenomenal. In this study we explore the influence of SCMI on value creation in 3-Star hotels in the Bono Region of Ghana. The study employed quantitative survey research methodology with data collected from a sample of 32 employees and 92 customers of the 3-Star hotels in the Bono region of Ghana using structured survey questionnaire. We identified the value of strategic supplier partnership, inventory management and lean practices as optimal in creating value in the integration process. The study further reveals an overall positive significant relationship between SCMI and value creation for 3-Star hotels in the bono region of Ghana. Three factors namely: strategic supplier partnership, inventory management and lean practices were significant in predicting best fit equation for value creation. The study was restricted to only 3-Star hotels located in the Bono region of Ghana, their staff and customers. The study recommendations should assist industry players to appropriately review SCM practices in 3-Star hotels in Ghana and such practices effect on value creation, and to also formulate a step-by-step implementation guide for future adoption. The study further contributes to the body of knowledge in SCM practices in Ghana's hospitality industry.

Key words: Supply Chain Management Integration, Value Creation, Hotels, Hospitality Industry, Ghana.

Introduction

The Three-Star Hotel industry in Ghana is vitally acknowledged as drivers of economic growth in emerging economies such as Ghana. The industry has

contributed and continue to play a major role in the economic development in spite of the recent COVID 19 disruptions. The tourism industry as a whole contributed \$3.8 billion US dollars in foreign exchange earnings in 2019 to the country's economy (Knoema, 2021). In view of the industry's contribution to the Ghanaian economy, the industry's potential to propel feature economic growth and job creation is not in doubt. Furthermore, past studies (Nomnga, 2021; Li, Jin & Shi, 2018; Hole & Snehal, 2019) have alluded to the importance of the hospitality industry to economic growth and alleviating poverty. However, the hospitality industry's viability and sustainability strongly depend on industry players ability to strategically fully integrate SCM practices in a strategic manner in order to create value that eventually meet customer demands (Rosa Hendijani & Reza Saeidi Saei, 2020).

With the current global smart world dynamics and information age, SCMI is a key driver to creating value and attracting potential consumers along the value chain (Rejeb & Keogh, 2021; Yu, Li, Wang & Duan, 2019). In the USA, Europe and Asia businesses are focusing more attention on rapid development of digital technology enablers of SCMI that create value (Bhandal, Meriton, Kavanagh & Brown, 2022). These emerging are helping to improve efficiency and create more collaborative operating models. On the contrary, according to the West African Institute of Supply Chain Management (WAISCM), businesses and policymakers in West Africa, including Ghana, continue to underestimate the strategic importance of supply chain management (SCM) in today's world, and as a result, continue to suffer largely due to the failure to apply SCM principles to business activities (Mensah, Diyuoh & Oppong 2014).

SCMI refers to the strategic collaboration between upstream and downstream partners along the value chain in order to harmonise resources and capabilities for the mutual competitive advantage of partners across the entire supply chain (Zhu, Krikke, & Caniëls, 2018). Value creation refers to synergistic effect derived through member's collaborative effort in producing and delivering products that meet customer demands (Simatupang & Sridharan, 2018). SCMI needs a common platform to co-run the chain of activities that affects the value chain, hence the need for the partners to jointly develop such platforms for their mutual benefits. Both SCMI and value creation are of immense importance in supply chain (SC) practices, and as such requires every member's collaboration in the SC to achieve its full potential. SCMI and value creation has generated noticeable interest scholars industry players, and entrepreneurs (Avelar-Sosa, García-Alcaraz & Maldonado-Macías, 2019); Maheshwari, Gautam & Jaggi, 2021); Chalmeta & Santos-deLeón, 2020). However, previous empirical studies focused extensively on the processes and practice of SC with minimal focus on how SCM factors collectively contribute to integration and creation. This study is thus motivated by this obvious research gap in the literature hence our interest in investigating the impact of combined influence of the factors of SCMI on value creation in the prestigious 3-Star hotels in Ghana. The fundamental question will be, what are those SCMI factors that collectively impact significantly on value creation? In this paper, we consider these individual SCMI factors and assess their combined influence on value creation from the context of collaborations in 3-Star hotels in the bono region of Ghana.

Three research questions (Rs) and their related hypothesis arise namely, R₁: What is the relationship between the SCMI factors and value creation? R2: What is the level of impact of the factors of SCMI on value creation? R₃: What is the relative strength of combined SCMI factors contribution in achieving best fit equation for 3-Star hotels value creation in the bono region of Ghana? The related hypothesis: H₀: there is no relationship between the combined effect of SCMI and supply chain value creation among 3-Star hotels in bono region of Ghana, and H₁: there is a relationship between the combined effect of SCMI and supply chain value creation among 3-Star hotels in bono region of Ghana.

This paper is organised as follows. In Section 2, we review the relevant literature. Section 3 discusses the methodology of the study. In Section 4 we analyse and discuss the results. Section 5 concludes the study with practical recommendations and future research directions.

Literature Review

The literature review mainly focuses on the conceptual and empirical aspect in the following key areas: SCM concepts, SCM integration, value creation and SCM practices in the hotel industry.

Supply Chain Management Concepts

The fundamental objective of SCM according to Zhao and Hou (2021), enhances throughput while at the time systematically reducing both inventory and operating expense. Throughput in this context refers to the frequency of occurrences sales, depending on the market under consideration (Hugos, 2018). In certain markets customers' value are willing to pay high prices for high levels of services, whiles in other markets customers will prefer the lowest price. As stipulated by

Kozak, Madlenak and Neszmelyi (2020), industries and businesses such as 3-Star hotels may define their supply chain capabilities five distinct in production, inventory, location, transportation and information. These areas envisioned as performance drivers to be managed so as to produce the capabilities required any given supply chain (Piya, Shamsuzzoha & Khadem, 2020). The concept of SCM practices according to Min (2021), first emerged in the mid-1980s, incorporating interorganizational operations management, system integration, and information sharing. However, many studies (Al Humdan, Shi & Behnia, 2020; Nayak & Choudhary, 2020; Barykin, Kapustina, Sergeev, Kalinina, Vilken, de la Poza, ... & Volkova, 2021) have stated that the concept of SCM can be attributed to physical distribution and logistics.

The concept of SCM as articulated by Frazzon, Rodriguez, Pereira Pires and Uhlmann (2019) suggest that emphasises the coordination, collaboration, and relation among members, and in three dimensions namely; activity and process administration, interfunctional interorganizational coordinations. Dolgui Ivanov and Sokolov (2020) re-echoed the dominant theory backing supply chain to be major areas, first; structure, configuration, and coordination; and the second, strategy, governance, and power. According to Sharma and Khanna (2020), the key point in SCM practices relates to the entire process being viewed as one system encompassing all the critical processes that leads to creating, sourcing, production and deliver in line with demand. To attain supply chain competitive advantage all players should work together, deploying appropriate technological tools in gathering information relating to the demands of the

market as well as exchanging information among members along the value chain (Di Vaio & Varriale, 2020). Di Vaio and Varriale (2020) emphasised that the concept of SCM practices encompasses managing all activities involved in the supply and acquisition, including logistics management activities, coordination and collaboration with partners; such as suppliers, intermediaries, third-party companies and consumers in the value chain.

Supply Chain Management Integration

SCMI refers to the extent to which businesses strategically collaborate with their suppliers in the management of interand intraorganizational processes in the value chain (Kang, Yang, Park & Huo, 2018). Past studies on SCI (Hasim, Fauzi, Endut, Yusof & Ridzuan, 2020; Sayan, Çalıpınar & Koç, 2021; O'Connor, Lowry & Treiblmaier, 2020) rightly indicated that the concept emphasises the integration of information among suppliers, manufacturers, distributors, and customers. Some definitions of SCMI stressed on material flows their components, while others focused mostly information, resources, and cash flows (Jia, Blome, Sun, Yang & Zhi, 2020). Many of the benefits arising from businesses that have implemented SCI includes: improved financial performance, enhanced customer satisfaction and growth in market share (Zhao, Wang & Pal, 2021; Madhani, 2020; Li, Chen, Wu, Hung & Lin, 2020).

Generally, SCI is made up of internal and external integration (Prajogo, Toy, Bhattacharya, Oke & Cheng, 2018). Internal integration consists of the extent to which the businesses organize its internal activities, processes, and strategies aimed at meeting the needs of customer (Zhang,

Lettice, Chan & Nguyen, 2018). The process involves collaboration coordination across the entire organizational functions by wav of information sharing in order to better appreciate and prescribe solutions to the needs of customers (Helo & Hao, 2019). While according to Mehdikhani and Valmohammadi (2019),integration deals with collaboration and coordination between businesses and their external supply chain partners. Different approaches have been adopted categorizing external integration. External integration is either categorized into supplier and customer integration which involves coordinated and pragmatic links between businesses and their suppliers or/and customers (Homchant, 2019; Hendijani & Saeidi Saei, 2020; Afshar, & Fazli, 2018), or into product and process dimensions Perdana, Ciptono & Setiawan, 2019) which handles the participation of suppliers and customers in developing new products (Huo, Ye, Zhao & Zhu, 2019; Gunasekaran, Dubey, Childe, Papadopoulos, Luo, Wamba & Roubaud, 2019). Process integration promotes interdependency in cohesion, implementation of the supply chain processes incorporating suppliers customers with the sole aim of eliminating non-essential activities and enhancing the speed of information flow, material supply and cash flow requirements along the supply chain (Zhang, Guo, Huo, Zhao & Huang, 2019).

Value Creation

As stated by Reklitis, Sakas, Trivellas and Tsoulfas (2021), value creation is the process where the capabilities and competencies of partners in a supply chain are combined create an improved competitive advantage from one or more of the partners in the SC relationship. For

instance, value creation arises when a supplier gains new ideas or other valuable inputs from its customer firm (Stare, & Jaklič, 2020). As stated by Castañer and Ketokivi (2018), two types of value creation principle in SC relationship emerge: sequential interdependence and reciprocal interdependence. Supply chain managers requires enhance comprehensive approach competencies coordinating combining knowledge across the corporate sphere. As observed by De Regt, Barnes and Planger (2020), the process of value creation comprises other segments apart from the nature and type of dependence or interdependence existing among businesses in the value chain. Such components may be objectives relationships goals, the coordination direction, and the nature of the valuecreation initiatives all needs to be incorporated in developing comprehensive and objective task-oriented model.

The basic goal of SCM is to integrate and manage the procurement, flow, and control of materials across many departments and layers of suppliers from a complete systems perspective (Abdallah, Obeidat & Aqqad, 2017). With the goal of optimising the order fulfilment process, SCM has moved its focus from production efficiency to customer-driven and partnership synchronisation approaches (Bititci, Martinez, Albores-Barajas & Parung, 2017). The purpose of hotels, like any other business, is to make money by providing excellent service consumers to reasonable prices. As firms grow more integrated into supply networks, value becomes more complicated multidimensional (Hague & Islam, 2015). Internal value, often known as shareholder value, refers to an increase in profits that supports the company's financial goals and the SC partners' further growth. When the

strategic priorities of SC partners are converted into SC objectives, they can be implemented as SC operations, according to Kaliani, Chandran and Awais (2016). As stated by Lagat, Koech, and Kemboi, (2016), in order to smooth SC operations and act in accordance with the chosen SC strategy, the relevant capacities and inventories must be effectively positioned. According to Spina, Di Serio, Brito and Duarte (2015), these capacities inventories make up the SC structure, which must be improved in order to attain high SC performance. Krikke (2020) relates the creation of internal value to the SC design, which focuses on the design of the SC strategy, structure, processes, operations, and management elements to achieve the market objectives.

External value on the other hand provides high quality products that meet customer needs of price, service, and image (Martínez-Olvera, Davizon-Castillo, Tozan & Erturk, 2015). Xiao, Wilhelm, Vaart and Donk (2019) explain that the success or failure of the SC is ultimately determined at the marketplace by the end consumer. Jona-Lasinio, Manzocchi and Meliciani (2019) also points out that the service provided to the end customer is determined by the effectiveness and efficiency of the cooperation of all the partners within the SC. Therefore, in this customer-oriented context, the SC as a whole must focus on providing the customer with what they want, how they want it, where they want it, and when they want it (Classen & Friedli, 2019).

Supply Chain Management in the Hotel industry

Suppliers of raw materials, components, and services (such as expertise and especially skilled labour) to the luxury accommodation industry can be a source of

power to the business. The luxury accommodation industry is highly dependent on its suppliers as quality needs to be assured (Koech & Ronoh, 2015).

Contracted suppliers must deliver both fast and high standard inputs. Intercontinental hotel group in the United States recognises the significant role it plays in the local economic development. Goods services are sourced locally in order to support local suppliers (Maalouf, 2018). The intercontinental hotel also understands the need to promote responsible business practices by those same suppliers (Manha & Tukamushaba, 2015). According to the CBRE research special report of 2009, most five-star hotels in China operate under the pure management business model (Xu & Gursoy, 2015a). With this model, hotel operators usually act as agents running the hotel business for the property mostly domestic owners who are developers. The hotel owners management fees to hotel operators based on profits and revenues, and other preagreed expenses like marketing and royalty fees. International brands in China which run most of the five -star hotels maintain a competitive edge over most domestic operators in terms of their global networks, marketing and reservations systems.

Manufacturing and service supply networks are the two most common types of supply chains identified in the literature on SCM. The former is described as the inbound and outbound service experiences supplied to consumers by firms, whilst the latter is defined as the process by which units are changed from raw materials into goods and sold to end-consumers (Carter, Hatton, Wu, & Chen, 2019). Manufacturing and services supply chains which forms part of most hotels value chain according to Xu and Gursoy (2015a), refers to as a link of

hotel businesses carrying out different activities such as supply of product or services components, including raw food ingredients, equipment and furniture; and the distribution and marketing of the final services to customers of such hotel businesses. Hence, managing hotel supply chain extends beyond procurement and logistics and differs from the typical SCM practice in six forms. The First unique feature is that hotel products are perishable in nature comes with lower product variable cost compared to the fixed cost (Zhang et al., 2019) hence, managing the streams becomes extremely important for hotel businesses. Secondly, hotels generated customer demand is critical especially in terms of favourable word-of-mouth (Gandhi, Sachdeva & Gupta, 2019). The third feature is the fact that, hotel products is most cumulative result of a variety of providers, mostly described as a closed-loop system (Xu & Li, 2016). Fourth, hotel demand is unclear due to fierce rivalry among hotel firms and the industry's vulnerability to external variables such as weather. Fifth, the systematic production and consumption of the hotel services affects logistics. Finally, collaboration among hotel and their allied partners is critical as multiple services provided by businesses in the value chain can be offered to customers as a package at the least cost.

Methodology

The study used quantitative research design approach in achieving the study objectives. The approach enabled us to develop the research objectives and subsequently derive the appropriate research questions and then design a research strategy to answer the study research questions. Past studies on SCMI (Le, Wu & Zhong, 2021; Arifin, Ibrahim & Nur, 2019; Tang, Chau, Ip & Ji, 2022) have widely established the

importance of quantitative research design and its relative reputation measuring the four SCMI independent constructs (strategic supplier partnership, information sharing about products and targeting strategies, inventory management and lean practices) effect on the dependent construct (value creation). The research again considered quantitative technique as more ideal technique due to the possible generalization of the research result (Pandey & Pandey, 2021).

The study is descriptive with practical purposes. The statistical population of the research included 3-Star hotels in the bono region of Ghana. The research data was obtained from CEO/managing directors, managers, senior managers, managers, accounts officers/accountants, procurement/purchasing, inventory and logistics officers as well as experts in the hotel industry with related task functions. All 3-Star hotels within the bono region were considered in the study sample (Ligon, Stoltz, Rowell & Lewis, 2019). purposeful sampling technique was used to select the employees sample size of 32 from a population of 56 staff of the two hotels due to the specific skills set and competences required of the research focus. On the other hand, a simple random sample size of 92 was computed from an estimated population of 192 customers who were either resident or visited the two 3-Star hotels within the period of administering the questionnaire.

The study used a self-designed validated survey instrument in the data collection. The data was mainly obtained through emails from subject experts from the procurement and supply chain, finance and other related departments of the two 3-Star hotels. The instrument validation process involved ten subject area experts from the procurement and finance departments of

two other hotels reviewed the research instrument in order to find any possible deficiencies in the instrument structure, wording, syntax and construct. The revised instrument based on the feedback received was again piloted among 10 subject area expects from tertiary institutions within the bono region. Their feedback resulted in a few minor edits mostly related to the instrument wording and syntax errors before the instrument was eventually administered to participants. We further conducted a test-retest reliability from among 10 respondents in the sample over a 7-day period. The reliability test results produced a coefficient of r = .87, which was well above the acceptable construct validity correlation coefficient of r = > 0.5 (Heale & Twycross, 2015).

The survey consisted of 52 and 47 questions for the hotel staff and customers respectively with a 5-point Likert scale to measure 3-Star hotels SCMI influence on value creation of with six questions for each section. Similar previous studies on SCMI influence on value creation (Xu & Gursoy, Al-Ababneh, 2015b; Al-Sabi, Shakhsheer & Masadeh, 2017) informed the choice and structure of the instrument for the study. Two separate questionnaires were designed for the study: one for customers and the other for employees. The questionnaire for hotel customers had sections for; demographics of respondents, patronage of hotel services by respondents, SCMI practices and value creation. The questionnaire for employees dealt directly with identifying SCMI practices at 3-Star hotels in the region. This comprised sections for demographics of respondents, hotel SCMI practices and value creation. The data collected was subjected to statistical analysis using descriptive statistics, correlation, and regression

analysis to ascertain the significance level of the study attributes of hotels SCMI practices and value creation.

Results and Discussions

The results and discussions primarily focus on the following key areas: the relevant study demographics, the descriptive statistics, the correlation analysis, the regression analysis and the discussion of the results.

Demographic Statistics

The results as presented in table 1 indicate that 47 of the respondents had HND and/or first degree, 25 had other academic qualifications certificate, (diploma, professionals) whereas 10 of respondents held secondary school certificates or master's degree. The analysis further revealed that the 2 General Managers of the participating hotels responded to the questionnaire, 6 senior managers, 7 managers and 7 accounts officers also provided responses to the study questionnaire. The highest number of responses of eleven was received from purchasing clerks for the participating hotels, The analysis further showed that 5 of the respondents had less than 1-year professional experience, 12 of them had 1 to 5 years professional experience, 11 had 6 to 10 years professional experience whereas 4 had over 10 years professional experience in their respective professions. The study requested respondents to indicate the number of days they stayed in the participating hotels. As shown in the analysis, 42 of the respondents were at the hotel for less than 3 days, 33 of the customers stayed 3 to 5 days at the hotels and 10 of participants stayed 1 to 2 weeks, whiles 7 of respondents stayed more than 2 weeks at the hotels. Finally, customers were requested to indicate the services of value in the hotels that attract them. The results indicated that 44 of the customers found conference rooms as their service of value, followed by business centre with 17 of the respondents identifying it as the service of value and 11 chose fitness centre (gym) as their service of value. Other services of value to customers included Swimming Pools (5), Kids Club and other kids' friendly activities (4), Spa (3), Transport (4), Casino (1) and restaurant and bar (2).

Table 1. Respondents Demographics

D	Hotel Staff		Hotel Cust	NΤ		
Demographics	frequency	Percent	frequency	Percent	N	
Educational Background						
Secondary	5	16	10	11	124	
HND/First Degree	21	66	47	51	124	
Master's degree	3	9	10	11	124	
Other (Diploma, Certificate, Professionals)	3	9	25	27	124	
Position						
CEO/ Managing Director	-	-	-	-	32	
General Manager	2	6	-	-	32	
Senior Manager	6	19	-	-	32	
Manager	7	22	-	-	32	

Source: Authors' analysis from Survey data

Descriptive statistics.

Others

The results of the descriptive analysis showed that the mean values of all the SCMI factors were fairly distributed (M = 2.18, SD = 0.88), (M = 2.61, SD = 0.97), (M = 2.53, SD = 0.87) and (M = 2.06, SD

= 0.98), with an average variance and range at (Var = 3.15, Range = 0.72). The test of skewness between the factors adequately normal for the purpose of this study. Table 2 provides the details.

Table 2. SCMI Determinats

Variable	N	M	SD	Var	Skewness	Range
Strategic Supplier Partnership	124	2.18	0.88	3.23	0.25	0.78

Information Sharing about Products and targeting strategies	124	2.61	0.97	3.26	-0.05	0.73
Inventory Management	124	2.53	0.87	2.92	0.29	0.67
Lean Practices	124	2.06	0.98	3.18	-0.03	0.69

Ayam & Kusi

Source: Authors' analysis from Survey data

Correlation Analysis

The correlation results of four variables: hotel strategic supplier partnership, hotel inventory management lean and management practices promote fair and reasonable pricing of services and products, hotel supply chain practices continue to influence the good image of the hotel and its patronage and hotel provides quality and services due products information sharing and feedback system being practiced, showed medium to low positive correlation effect of r = .294, r =

.260, r = .170 and r = .169 respectively. The statements; hotel supply chain practices Promotes Integration, effective inventory management and Influences Performance along the Value Chain and hotel supply chain practices Influence Brand Quality, showed negligible correlation effect of r =.122, r = .119 respectively. The relative association between of statements relating to the independent variables (statements) and the dependent variable (value creation) was significant at p < .01 and p < .05 (see table 3 below).

Table 3. Summary of correlation Analysis

Variable	1	2	3	4	5	6	7	M	SD
(1) Value Creation	-	.294**	.260**	.169*	0.122	0.119	.170*	2.33	1.08
(2) Strategic Supplier Partnership	.294**	-	.704**	.190*	.396**	.361**	.327**	1.88	1.12
(3) Lean Inventory Practices.	.260**	.704*	-	.183*	.380**	.393**	.208**	2.81	0.75
(4) Information Sharing about products	.169*	.190*	.186*	-	0.015	.685**	.225**	2.17	0.81
and services (5) SCM Practices Promote	0.122	.396**	.380**	0.015	-	0.124	.191*	2.49	1.21

Good Reputation (6) SCM Practices Influence Brand Quality (7) SCM Practices Promotes	0.119	.361**	.393**	.685**	0.124	-	.227**	2.26	0.91
Integration, effective inventory management and Influences Performanc e along the Value Chain	.170*	.327**	.208**	.225**	.191*	.227**	-	2.01	0.70
M	2.33	1.88	2.81	2.17	2.49	2.26	2.01	-	
SD	1.08	1.12	0.75	0.81	1.21	0.91	0.70		

^{*} Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed)

Source: Authors' analysis from Survey data

Regression Coefficient

From the analysis in table 4, the results showed an overall high level of significance of all the factors of SCM but one factor. The factors; strategic supplier partnership p = .001, inventory management p = .003 and lean practices p

= .000 revealed high significance levels of effect on value creation in the two hotels. Whereas the factor; Information Sharing about Products and targeting strategies with p value p = .171 and beta weight of .101 was found not be significant in influencing value creation in the two hotels. The details are found in table 4.

Table 4. Regression Coefficient

Variable	Coefficient	Std. Error	В	-95% CI	95% CI	T	P
(Constant)	-1.273	3.07		- 10.535	7.374	0.407	0.000
Strategic Supplier Partnership	0.196	0.302	0.121	-0.497	0.750	2.504	0.001
Information Sharing about Products and	-0.087	0.22	0.058	-0.201	0.391	1.105	0.072

targeting strategies							
Inventory Management	0.118	0.039	0.124	-0.025	0.177	2.700	0.023
Lean Practices	0.175	0.192	0.120	-0.554	0.287	- 0.853	0.000

Source: Authors' analysis from Survey data

Best fit equation analysis

The results of the regression analysis revealed notable similarities with the results of the correlation analysis in relation to the variables with significant outcome and the degree of positive correlation. The best fit regression equation for financial sustainability is;

$Y_{VC} = a + \beta_{SSP} + \beta_{IM} + \beta_{LIP},$

Where Y_{VC} = value creation (predictor variable),

a = constant value

 β_{SSP} = strategic supplier partnership (independent variable),

 β_{IM} = inventory management (independent variable), and

 β_{LIP} = lean inventory practices (independent variable).

Hence regression equation for $Y_{VC} = 1.117 + 0.347\beta_{SSP} - 0.890\beta_{IM} + 0.383\beta_{LIP}$.

The regression analysis determined the best regression equation by including all statements with coefficient higher than zero and p value of p < .05 significant level which also supported the rejection of the null hypothesis (H₀).

Discussion

The study's results showed that the respondents were to some extent optimistic about the level of influence of the SCMI factors on the impact of value creation. Participants were generally unanimous about the successes of SCMI practices dependent on the value it creates and alignment with organizations goals and objectives. While previous research (Le,

Wu & Zhong, 2021); Hendijani & Saeidi Saei, 2020; Huo et al., 2019) sought to confirm the importance of these individual factors, the study findings present statistical evidence to support three of the four factors as having a statistically significant relationship. Previous studies on SCMI practices failed to adequately address the SCMI factors effect on value creation (Maalouf, 2018; Mufutau, Victor Oladimeji, 2021). This study aimed to establish the extent of the relationship the various SCMI influence on value creation of 3-Star hotels in the bono region of Ghana.

First of all, the study found that strategic supplier partnership, inventory management and Lean practices were significant in assessing the effectiveness of SCMI practices in 3-Star hotels in the region. On the other hand, information sharing about products and targeting strategies was found not to be significant in assessing the effectiveness of SCMI practices in the hotels. The study outcome is in contrast with the findings made by Arifin, Ibrahim and Nur (2019), Tang et al (2022), Janaki, Izadbakhsh and Hatefi (2018), and Masudin, Kamara, Zulfikarijah and Dewi (2018) which generally concluded that information sharing about products and targeting strategies was found to be significant in assessing the effectiveness of SCMI practices in hotels. Janaki et al., 2018 rightly corroborated the study outcome that strategic supplier partnership is influential

in assessing the effectiveness of SCM practices. The study found medium to minimal positive correlation between supply chain management practices and value creation in the two hotels in the bono region of Ghana. This outcome is corroborated by Nyakwaka (2021) who acknowledged the influence of SCMI factors on value creation in the hotel industry.

Conclusion

The purpose of this study was to investigate the strength of the relationship between SCM practices on value creation among 3-Star hotels in the bono region of Ghana. Three of the factors namely: strategic supplier partnership p = .001, inventory management p = .003 and lean practices p= .000 emerged as significant determinants of effective SCMI practices and on value creation of 3-Star hotels in the bono region of Ghana. However, Information Sharing about Products and services had no significant relationship and effect in determining the adoption implementation of SCMI practices and its long- term effect on value creation. The study found an overall significant relationship between SCMI practices and value creation for 3-Star hotels supported with an all-embracing SCM implementation strategy well aligned with the hotel industry specific practices.

Recommendations

The study outcome reveals a number of useful practical recommendations based on the conclusions on the factors of SCMI practices and value creation which is worth exploring by practitioners.

 The findings showed strategic supplier partnership, inventory management and lean practices had medium to minimal positive correlation on value creation. The management of the hotel should

- aim at strengthening these key influential factors in other to achieve optimum efficiency. This can be realised through regular training and the deployment of ICT tools in the supply chain management systems of the hotels and in building credible database of suppliers to facilitate timely free flow of information between the hotels and their suppliers.
- The practice of information sharing about products targeting strategies was identified by the study to be weak in the hotels. This can be resolved by the hotels keeping accurate database of suppliers, which would enable hotels disseminate to information about new products and seek the input of the suppliers before final implementation. Making strategic suppliers to feel part of the hotel's decision would make them feel part of the company and hence make them provide quality and affordable supplies to the Hotels.

Future Research Opportunities

- There is substantial future research opportunity worthy of examination in the area of SCMI practices and value creation. Some of the areas worthy of recommendation include:
- 1. Research scope: The scope of further research should be widened to include all 3-Star hotels in Ghana in order to provide a better overview of the extent of implementation, challenges as well as benefits of deploying SCM practices in hotels in Ghana
- 2. Mixed research methods of data

- collection could be considered for any further research on SCM practices in hotels in Ghana.
- **3.** In subsequent studies, it is recommended that the population should be increased to include other categories of hotel ratings

such as one star and two star rated hotels in the country. Attention should also be given to suppliers in the industry hence the population and sample size for future studies should include suppliers of goods and services in the hotel industry.

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Assessment of Users' Trust and Satisfaction On E-Commerce Services Among Students of The University of Ilorin, Kwara State, Nigeria

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Abstract:

Despite the growth of e-commerce services over a decade now, users and providers, especially in a developing country like Nigeria are still posed with some challenges in their use and delivery of ecommerce services. In view of this, this study aims to assess the level of users' trust and satisfaction on e-commerce services among students at the University of Ilorin, Ilorin, Kwara State. A survey design was adopted using a structured and validated questionnaire to collect data. A total sample of 267 students was selected using a stratified sampling technique from the Five departments in the Faculty of Communication and Information Sciences (FCIS), University of Ilorin. Descriptive statistics such as frequency, percentages, and means were used to analyze data. Findings revealed a moderate level of trust and satisfaction of e-commerce services. It further revealed some perceived factors that affected users' trust and satisfaction on e-commerce services such as delay in delivery of purchased products, website inaccessibility, lower quality of products, fake certification of warranty on damaged products, and inability to make the payment due to connectivity issues among others. Also. users reported challenges such as the inability to locate customers' addresses by providers, delays in product delivery, and the problem of tracking ordered products among others. It was concluded that there is a need for regular user surveys to ascertain the level of trust and satisfaction derived from e-commerce services; to improve service quality and delivery. There is also an urgent need for relevant stakeholders such as ecommerce providers and the government to address numerous challenges faced by users in the use of ecommerce services in Nigeria.

Key words: E-commerce, Users, Trust, Satisfaction, Services, Providers

Introduction

Over the past few decades, e-commerce has been growing at a very fast pace and has attracted diverse users online due to the process of buying and selling goods and E-commerce can be defined services. simply as any kind of business that deals in selling and purchasing products or services through electronic systems like computer networks and the Internet (Turban, Outland, King & Turban, 2018). This definition depicts that the use of ecommerce services requires access to relevant Information and Communication Technology (ICT) tools such as the internet, broadband, and other electronic devices and gadgets such as a laptop, Ipad, tablet, and mobile phone to transact business successfully. Therefore. availability and accessibility to these tools are of utmost importance to existing and potential users of e-commerce services.

In recent times, the unprecedented growth of the internet has led to wide adoption and use of e-commerce services globally by individuals and corporate organizations This has resulted in several studies on ecommerce adoption, both locally and globallyfrom varying angles and perspectives (E.g. Abgoke, 2018; Kabugumila, Lushakuzi & Mtui, 2016). Despite the growth of e-commerce services, it had been reported in the literature that e-commerce service providers are faced with challenges, especially in the area of efficient service delivery. Some of these challenges include failure to satisfy customers' expectations, connectivity issues and network; the high price of logistics, privacy and security concerns of transactions on e-commerce platforms among others (Agbata, 2019; Rinchi, 2019; Abgoke, 2018; Kabugumila,

Lushakuzi & Mtui, 2016). The resultant effect of these challenges may be the gradual eroding of users' trust and satisfaction in the use of e-commerce services, especially in a country like Nigeria; thereby affecting e-commerce usage.

Online trust has been defined as "an attitude of confident expectation in an online situation of risk that one's vulnerabilities will not be exploited" (Beldad, 2010). This shows that trust is a precursor of satisfaction in e-commerce (Harris & Goode, 2014; Jin & Park, 2016). On the other hand, satisfaction refers to an overall evaluation based on the total purchase and consumption experience with a service over time" (Anderson, Fornell & Lehmann, 2014). Therefore, satisfaction is a precursor of customers' commitment; and it is a result of customers' evaluations regarding a product and the decision to repurchase (Kasmer, 2015). Trust has been considered a critical element in relationship building between buyers and sellers, and post-purchase also in determining satisfaction (Verhoef, 2012). Therefore, due to the operating environment of a developing country like Nigeria, where there are technological and logistics problems; this may likely result in issues of trust and satisfaction on e-commerce services, thereby affecting the intensity of usage overtime (Lawal & Ogbu, 2015; Olusoji, Ogunkova & Elumah, 2015). The importance of this study to the Nigerian environment cannot be overemphasized; most especially at this critical period when e-commerce service providers are currently faced with socio-economic challenges and their attendant problems as it relates to the delivery of excellent services to their numerous customers. Therefore, in light of the above, this study intends to assess the level of users' trust and satisfaction of ecommerce services among students of the University of Ilorin, Ilorin, Kwara State, Nigeria.

Aims and Objectives of the Study

The main aim of the study is to assess the level of users' trust and satisfaction on e-commerce services among students in the University of Ilorin, Kwara State. Specifically, the objectives are as follows:

- i. To determine the frequency of use of selected e-commerce sites among students in the University of Ilorin, Kwara State, Nigeria.
- ii. To assess the level of trust in the use of e-commerce services among students in the University of Ilorin, Kwara State, Nigeria.
- iii. To find out the level of satisfaction in the use of e-commerce and services among students in the University of Ilorin, Kwara State, Nigeria.
- iv. To determine the perceived factors influencing users' trust and satisfaction of e-commerce services among students in the University of Ilorin, Kwara State, Nigeria. v. To identify the challenges faced in the
- use of e-commerce services among students in the University of Ilorin, Kwara State, Nigeria.

Research Questions

This study was guided by the following research questions listed below:

- i. What is the frequency of use of selected e-commerce sites among students of University of Ilorin, Kwara State, Nigeria? ii. What is the level of trust in the use of e-commerce and services among students in the University of Ilorin, Kwara State, Nigeria?
- iii. What is the level of satisfaction in the use of e-commerce and services among

students in the University of Ilorin, Kwara State, Nigeria?

iv. What are the factors affecting users' trust and satisfaction in the use of e-commerce services among students of University of Ilorin, Kwara State, Nigeria? v. What are the challenges faced in the use of e-commerce services among students of University of Ilorin, Kwara State, Nigeria?

Review of Literature

Researchers have examined users' trust and satisfaction of e-commerce services within and outside Nigeria. However, there are several independent studies on trust and satisfaction in the literature. Some of these studies are discussed briefly below:

Related Studies on Users' Trust in E-commerce Services

investigated Idongesit (2021)shopping tendencies and customer trust in a Nigerian Service sector, a case study of Jumia. A descriptive and correlational survey was adopted for this study with a sample size of 277 customers. Findings revealed a positive relationship between online shopping and trust among online shoppers in Jumia. On the other hand, Olusoji et al. (2015) investigated online shopping in line with perceived risk and trust between customers intermediaries. Findings revealed a negative relationship between perceived risk and trust among online shoppers. In a similar study by Kooli, Ben Mansour &Utama (2014) on the determinants of online trust and its effect on online purchase intention. The findings of this study revealed a relationship between purchase intention and online customer trust. These few studies have shown that there are some prevailing factors either negative or positive may affect customer trust. Nevertheless, whenever e-commerce

service providers meet customers' expectations there is the possibility of trust and users' satisfaction.

Related Studies on Users' Satisfaction and E-commerce Services

Quite a number of researchers have also investigated users' satisfaction and ecommerce services. In some of these studies, user satisfaction has been used interchangeably with customer satisfaction. Users are invariably customers of ecommerce services.

Ilumo & Yakubu (2017) conducted a study to examine the impact of e-commerce on customer satisfaction, a case study of Kaduna State Metropolis in Nigeria. The findings of this study revealed that internet reliability, inefficiency, and security had a significant impact on customer satisfaction. In the same vein, Indeche (2017) conducted a study to determine the impact of online service quality on customer satisfaction among online retailing sites in Nairobi. A descriptive research survey design was adopted with a sample size of 157 online shoppers. Findings revealed that customers of online retailing sites were generally satisfied with the services rendered.

Ayoola & Umar (2020) examined the effect of electronic marketing on customer satisfaction of selected Airline services in Nigeria. A total of 100 customers were surveyed for this study. Findings revealed that search engine optimization, social media marketing, and email marketing had a positive impact on customer satisfaction. These few studies have revealed that users of e-commerce services are satisfied, although there may be challenges faced by users in the course of transacting business.

their customers in order to maintain their customer base due to the high level of competition.

Perceived Factors affecting Users' Trust and Satisfaction and Use of E-commerce Services

There are prevailing factors that have been identified in the literature that can affect users' trust and satisfaction on e-commerce services. Some of these factors are identified below:

Firstly, the quality of user interface design can contribute to users' satisfaction on e-commerce services. For instance, Cyr (2018) found that interface design variables antecedents to website trust and website satisfaction across cultures. Also, Alam and Yasin (2019) found in their study in Malaysia that website user interface design is strongly related to customer satisfaction. Secondly, security is an essential element in the adoption of e-commerce services. However, the lack of security as perceived by e-commerce consumers represents a risk and the main obstacle to the development of e-commerce (Dong-Herong-Her, 2014). Flavia´n and Guinalý (2016)pinpointed that trust in the use of the internet is hinged on the security perceived by consumers regarding the handling of their private data.

Thirdly, Perceived privacy can equally contribute to users' trust and satisfaction on e-commerce services. Perceived privacy can be defined as consumers' ability to control the presence of other people in the environment during a market transaction or consumer behavior and the protection of a consumer's Personal Identifiable Information (PII) relating to specific transactions e-commerce (Goodwin, 2011). Therefore, privacy issues

This shows that e-commerce providers are

working relentlessly to ensure they satisfy

can threaten the trust and satisfaction of users on e-commerce services. Other factors that can determine users' trust and satisfaction include product display, price, real-time response, reception to feedback, good reviews and constantly adding value to customer needs (Zhao, 2018).

On the whole, the above-mentioned factors can bring about either trust or distrust, satisfaction or dissatisfaction depending on the perception of users of e-commerce services. Related Studies on Users' Trust in E-commerce Services

Challenges Faced by Users in the Use of E-commerce Services

Several users including organizations globally have benefited from e-commerce services, however, e-commerce usage is posed with some challenges especially in a developing country like Nigeria discussed in the literature such as high cost transaction, internet subscription charges, accessibility, privacy confidentiality, security issues, network reliability, credit card threat, authenticity among others (Adeyeye, 2008; Ajayi, 2008; Adeshina & Ayo, 2010). Other challenges include trust issues, logistics issues, poor internet connectivity, and low quality of products among others (Agbata, 2019; Rinchi, 2019; Abgoke, Kabugumila, Lushakuzi & Mtui, 2016). On the whole, the review of literature has shown that regardless of the level of adoption of e-commerce services, there are challenges that users face in the use of these services Therefore, these challenges need to be addressed to improve adoption of ecommerce services overtime.

Methodology Research Design

A descriptive survey research design was adopted for this study using a structured and validated questionnaire as the main instrument for data collection. Descriptive analysis was used to field analyze such as frequency, percentages, and standard deviation.

Population of Study

Afolayan & Ayanwuyi

The population of this study comprised undergraduate students selected from four Faculties in the University of Ilorin in the 2021/2022 session. The total population of students in the four faculties amounted to 13,350 students.

Sample Size and Sampling Techniques

A stratified sampling technique was used in the selection of 4 out of 15 faculties in the University of Ilorin, using a 2% criterion across the population of each of the four faculties as a basis for determining the total sample size as reflected in Table 1. Convenience sampling technique was used in the selection of respondents for this study.

	Table 1: S	Sample [Distribution	from the	Selected	Faculties
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S/N	Name of Facilities	Undergraduates Population	Sample of Selected faculty (2%)
1.	Arts	4,789	96
2.	CIS	2,313	46
3.	Life Science	3,645	73
4.	Social Science	2,603	52
	Total	13,350	267

Source: Faculty Office

Research Instrument

A self-developed structured and validated questionnaire was the main instrument for data collection. The questionnaire was divided into six sections. Section A comprised of items that captured the demographic data of the respondents such as gender, age, level, and faculty. Section B comprised 5 items measuring the level of users' trust in e-commerce sites, while Section C comprised 5 items measuring the level of users' satisfaction on e-commerce sites. Sections D and E comprised 5 items each measuring perceived factors affecting users' trust and satisfaction respectively. Lastly, Section F measured the challenges encountered by users in the use of ecommerce sites.

Validity and Reliability of Research Instrument

The face validity of the research instrument was achieved through two experts in the field of Information Science who proofread the questionnaire items and effected corrections where necessary. The content validity of the questionnaire items was also determined by establishing Cronbach's Alpha reliability coefficient for the developed scales. The Cronbach's Alpha for the developed scales ranged from 0.80

to 0.88 as reflected in Table 2, depicting that the scales are reliable, thereby measuring what it purports to measure. Please find below the Cronbach's Alpha reliability coefficient for the developed scales.

Procedure for Data Collection

Field data was collected through the services of two Research assistants who assisted in the distribution. A total of 267 copies of the questionnaire were distributed by hand to students in the selected faculties. Out of the 267 distributed, all were found useable and returned valid. This gave a rate of return of 100%.

Method of Data Analysis

The data collected were analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequency counts, percentages, and mean were used to analyze the field data.

Table 2: Showing Cronbach Alpha Reliability Scores of the Measuring Scales

Scales measuring trust and	No of Items	Cronbach's Alpha
satisfaction		
Users trust scale	5	0.80
Users satisfaction scale	5	0.88
Perceived Factors affecting users'	5	0.80
trust		
Perceived Factors affecting users'	5	0.85
satisfaction		

Presentation of Results

their interpretations are presented in the below Tables:

Table 3: Demographic Information of Respondents

The results of the data analyzed alongside

Variables		Frequency	Percentage
Gender	Male	121	45.3%
	Female	146	54.7%
	TOTAL	267	100.0%
Age Range	16-20 years	101	37.8%
	21-30 years	120	45.0%
	31 years and above	46	17.2%
	TOTAL	267	100.0%
Level	100 level	58	21.7%
	200 level	81	30.3%
	300 level	86	32.2%
	400 level	40	15.0%
	500 level	2	0.7%
	TOTAL	267	100.0%
Faculty	CIS	46	17.2%
	Social Sciences	52	19.5%
	Life Sciences	73	27.3%
	Arts	96	36.0%
	TOTAL	267	100.0%

Table 3 presents the demographic data of the respondents in the study area. In terms of gender, 121(45.3%) of the respondents were males, while 146(54.7%) were females.

In terms of age of the respondents, 101(37.8%) were between 16-20 years, 120 (45.0%) 21-30 years of age, and 46(17.2%) were 31years and above. The majority of the respondents were between 21-30 years. In terms of level, 58(21.7%) 100level, 81(30.3%) 200level, 86(32.2%) 300level, 40(15.0%) 400level and 2(0.7%) 500level respectively. As for the faculty of the respondents, 46 (17.2%)CIS, 52 (19.5%) Social Sciences, 73(27.3%) Life Sciences

and 96(36.0%) Arts respectively.

Analysis of Research Questions i. Research Question One

What is the frequency of use of selected e-commerce sites among students in the University of Ilorin, Kwara State, Nigeria.

Table 4: Frequency of Use of Selected E-Commerce Sites among Students

S/	Frequency of	Occasionally	Often	Rarely	Never	Mean
N	Use of E-	(%)	(%)	(%)	(%)	(X)
	Commerce					
	Sites					
1.	Jumia	87	125	35	20	3.04
		(32.5%)	(46.8%)	(13.1%)	(7.5%)	
2.	Jiji	96	111	52	08	3.10
		(36.0%)	(41.6%)	(19.5%)	(3.0%)	
3.	Konga	99	101	60	07	3.09
	-	(37.1%)	(37.8%)	(22.5%)	(2.6%)	
4.	Karakata	86	99	51	31	2.90
		(32.2%)	(37.1%)	(19.1%)	(11.6%)	
5.	Amazon	82	93	65	27	2.86
		(30.7%)	(34.8%)	(24.3%)	(10.2%)	
6.	Adibba	78	97	58	34	2.82
		(29.2%)	(36.3%)	(21.7%)	(12.7%)	
7.	Slot	85	86	66	30	2.85
		(31.8%)	(32.2%)	(24.7%)	(11.2%)	
8.	Kara	66	86	80	35	2.69
		(24.7%)	(32.2%)	(30.0%)	(13.1%)	
9.	3C Hub	62	78	86	41	2.60
		(23.2%)	(29.2%)	(32.2%)	(15.4%)	
10.	Payporte	51	77	88	51	2.48
	• •	(19.1%)	(28.8%)	(32.9%)	(19.1%)	
	Mean Score		. ,	. ,	,	2.84

Table 4 shows the frequency of use of selected e-commerce sites among students

with a total mean of (2.84). This depicts that majority make use of e-commerce sites

effectively. Jiji ranked first with the mean of (3.10), konga, second with a mean of (3.09), Jumia third with a mean of (3.04). Only Payporte was of low usage with a mean value of (2.48).

ii. Research Question Two

What is the Level of Trust in the Use of E-Commerce Services among Students at the University of Ilorin, Kwara State, Nigeria?

Table 5: Level of Users' Trust on E-Commerce Service

S/ N	Level of Users Trust on E-Commerce Services	SA (%)	A (%)	D (%)	SD (%)	Mean (X)
1.	I trust e-commerce service providers because their products are always durable.	81 (30%)	79 (29.5%)	50 (18.7%)	57 (21.3%)	2.69
2.	At times, I experienced delay in the delivery of products ordered on e-commerce sites, but I still trust their service delivery system.	92 (34.4%)	70 (26.2%)	43 (16.1%)	62 (23.2%)	2.72
3.	The quality of the product delivered is always perfect which makes me to patronize e-commerce site at all times.	84 (31.5%)	99 (37.1%)	49 (18.4%)	35 (13.1%)	2.87
4.	I have never been scammed or duped on e-commerce sites as a result, I prefer buying online.	72 (26.9%)	90 (33.7%)	58 (21.7%)	47 (17.6%)	2.72
5.	I trust e-commerce providers because they deliver products on time.	88 (32.9%)	89 (33.3%)	61 (22.8%)	29 (10.9%)	2.88
	Mean Score					2.78

Table 5 shows the level of trust in the use of e-commerce and services among students with a total mean score of (2.78). 183(68.6%) of the respondents agreed that the quality of products of e-commerce providers are always perfect, therefore being instrumental to their consistent buying on e-commerce sites. 177(66.2%) also believe e-commerce service provider delivers on time. Again, 162(60.6%)of the respondents agreed that they have not been scammed or duped on e-commerce sites.

This result implies that users have a moderate level of trust in the use of ecommerce and services.

iii. Research Question Three

What is the Level of Satisfaction in the Use of E-Commerce Services among Students at the University of Ilorin, Kwara State, Nigeria?

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S/ N	Level of Users Satisfaction on E- commerce Service	SA (%)	A (%)	D (%)	SD (%)	Mean (X)
1.	I find it easy to navigate on e-commerce sites due to user friendly interface.	77 (28.8 %)	86 (32.2 %)	52 (19.5 %)	52 (19.5 %)	2.73
2.	The service quality of e-commerce providers is very impressive.	83 (31.1%)	88 (32.9%)	62 (23.3%)	34 (12.7%)	2.82
3.	My personal identifiable information (PII) and financial data is secure on e-commerce site.	79 (29.6%	93 (34.8%	48 (18.0%	47 (17.6%	2.76
4.	I feel comfortable paying for my products on e-commerce sites because they are secured.	85 (31.8%)	66 (24.7%)	69 (25.8%)	47 (17.7%)	2.71
5.	I feel dissatisfied due to delay in the delivery of product ordered.	72 (26.9%	82 (30.7%	50 (18.7%	63 (23.6%)	2.61
	Mean score	,	,	,	,	2.73

Table 6 shows the level of satisfaction in the use of e-commerce services among students at the University of Ilorin, Kwara State, Nigeria with a total mean score of (2.73). The majority 171(64.0%) of the respondents are satisfied with the quality of services rendered by e-commerce providers, while, 163(61.0%) find it easy to navigate on e-commerce sites due to user-friendliness of the interface, 151(64.4%) feel secure about their transactions on e-commerce sites. This result implies that

students are moderately satisfied with the use of e-commerce services.

iv. Research Question Four

(a) What are the Perceived Factors affecting Users' Trust and Satisfaction in the Use of E-Commerce Services among Students of the University of Ilorin, Kwara State, Nigeria?

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Table 7a: Perceived	1 Hactors attection	r I leere' I rijet	in the like i	ot H-Commer	CE SETTICES
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S/	Perceived Factors Affecting	SA	A	D	SD	Mean
N	Users Trust in the Use of E-	(%)	(%)	(%)	(%)	(X)
	Commerce Services					
1.	My trust is affected anytime I do not receive goods I ordered on time	88 (32.9%)	109 (40.8%)	51 (19.1%)	19 (7.1%)	3.00
2.	My trust is affected when the website is inaccessible due to connectivity issues	110 (41.1%)	113 (42.3%)	20 (7.5%)	24 (9.0%)	3.16
3.	My trust is affected when the delivery of product ordered takes longer time than expected	122 (45.7%)	128 (47.9%)	10 (3.7%)	07 (2.6%)	3.37
4.	My trust is affected anytime I receive a product of lesser quality to what is advertised	138 (51.7%)	123 (46.1%)	06 (2.2%)	00 (0.0%)	3.49
5.	My trust is affected when I found out I was scammed by transacting on an ecommerce site	129 (48.3%)	128 (47.9%)	10 (3.8%)	00 (0.0%)	3.45
	Mean Score					3.29

Table 7a shows the perceived factors affecting users' trust in the use of ecommerce and services among students with a total mean score of (3.29). The majority of the respondents agreed that their trust is mostly affected for the following reasons: 261(97.8%) whenever a product of lesser quality is delivered, 257(96.2%) scammed in the couse of transacting online, and 250(93.6%) delay in delivery of their purchased products

among others. This result implies that users' trust is very fragile, it can be breached when e-commerce providers do not meet the expectation of users.

(b)What are the Perceived Factors affecting Users' Satisfaction in the Use of E-Commerce Services among Students of the University of Ilorin, Kwara State, Nigeria?

Table 7b: Perceived Factors affecting Users' Satisfaction in the Use of E-Commerce Services.

S/	Factors Affecting User's	SA	A	D	SD	Mean
\mathbf{N}	Satisfaction in the Use of E-	(%)	(%)	(%)	(%)	(X)
	Commerce Services.					
1	My dissatisfaction is affected when there is a wide variation in price of products online compare to physical market.	109 (40.8%)	112 (41.9%)	14 (5.2%)	32 (11.9%)	3.12
2	I may feel dissatisfied when the product I ordered is not delivered on time.	105 (39.3%)	132 (49.4%)	25 (9.4%)	05 (1.9%)	3.26
3	I may feel dissatisfied when the product ordered is of low quality	124 (46.4%)	114 (42.7%)	29 (10.9%)	00 (0.0%)	3.36
4	I feel dissatisfied when I am not able to make payment due to connectivity issues.	106 (39.7%)	99 (37.1%)	40 (15.0%)	22 (8.2%)	3.08
5	I may feel dissatisfied due to fake certification of warranty on damaged products.	122 (45.7%)	126 (47.2%)	12 (4.5%)	07 (2.6%)	3.35
	Mean Score					3.23

Table 7b shows the perceived factors affecting users' satisfaction in the use of ecommerce and services among students at the University of Ilorin with a total mean score of (3.23). The majority of the respondents agreed that their satisfaction on e-commerce services are affected due to the following reasons: 248(92.9%) fake certification of warranty on damaged products, 238(89.1%) whenever product ordered is of low quality, while 221(82.7%) also agreed that whenever there is a wide variation of price of products online compared to the physical market among others. This result implies that users'

satisfaction are affected by the quality of products and services offered by e-commerce providers.

v. Research Question Five

What are the Challenges Faced in the Use of E-Commerce Services among Students of the University of Ilorin, Kwara State, Nigeria?

Table 8: Challenges Faced in the Use of E-Commerce Services

S/N	Challenges Faced in the	SA	A	D	SD	Mean
	Use of E-Commerce	(%)	(%)	(%)	(%)	(X)
	Services.					
1.	I feel dissatisfied when the wrong information is placed on the product advertised.	97 (36.3%)	113 (42.3%)	42 (15.7%)	15 (5.6%)	3.09
2.	I often experience connectivity issues whenever I want to buy online.	90 (33.7%)	98 (36.7%)	51 (19.1%)	28 (10.5%)	2.94
3.	At times, the delivery of my product is delayed due to inability to locate my address.		128 (47.9%)	12 (4.5%)	06 (2.2%)	3.36
4.	I often experience incessant power supply which affects buying online.		101 (37.8%)	48 (18.0%)	01 (0.4%)	3.25
5.	I have problems in tracking my order before its arrival	87 (32.6%)	82 (30.7%)	55 (20.6%)	43 (16.1%)	2.80
	Mean Score					3.09

Table 8 shows the challenges faced in the use of e-commerce services among students of University of Ilorin with a total mean score of (3.09) As indicated by the respondents, users of e-commerce services are faced with diverse challenges in varying degrees. For instance, 249(93.3%) of the respondents agreed that delay in product delivery due to inability to locate customer's address is a major challenge especially in the Nigerian environment, 218(81.6%) also agreed that incessant power supply is another challenge; while 169(63.3%) agreed that there is the problem of tracking order

arrival among others. This result implies that users face diverse challenges in the use of e-commerce services.

Discussion of Findings

This study investigated users' trust and satisfaction on e-commerce services. The findings of this study will be discussed in line with the earlier objectives as stated in this paper.

The first objective was to determine the frequency of use of selected e-commerce sites among students in the University of

Ilorin, Ilorin, Kwara State. Findings revealed that students mostly use ecommerce sites in varying proportions. For the mostly patronized instance, commerce sites among students are:Jiji ranked first with a mean of (3.10), konga ranked second with a mean of (3.09), and Jumia ranked third with a mean of (3.04) respectively. This finding conforms with Alaba, Igwe, Egejuru, Bello and Idowu (2017) who affirmed the use and high patronage of these sites amongst users due their popularity and high quality of services offered to the public.

The second objective was to determine the level of users' trust in the use of e-commerce services among students of the University of Ilorin, Ilorin, Kwara State. Findings revealed a moderate level of trust with a mean score of (2.78). The majority of the users have moderate trust in e-commerce services which shows that the services rendered met their expectations to an extent. This finding supports Zhao (2018) who pinpointed that trust underlies the use of e-commerce services.

The third objective was to determine the level of user satisfaction in the use of e-commerce services among students of the University of Ilorin, Ilorin, Kwara State. Findings revealed a moderate level of satisfaction with a mean Score of (2.73). The majority of the respondents agreed that they were satisfied with the quality of service rendered by e-commerce services. For instance, respondents agreed:

"that they find it easy to navigate on e-commerce sites due to the user friendiness of the interfaces",

They also:

"feel secure about their transactions on e-commerce sites".

These findings support past studies that found user interface designs, security, and protection on e-commerce sites serve as determinants of users' satisfaction (Alam & Yasin, 2019; Cyr, 2018; Flavia'n & Guinalý, 2016).

The fourth objective was to identify the perceived factors that affected users' trust and satisfaction in the use of e-commerce services among students of the University of Ilorin, Kwara State, Nigeria. The finding revealed similar factors that affected users' trust and satisfaction on e-commerce services such as delay in delivery of purchased products, website inaccessibility, lower quality of products, and fake certification of warranty on damaged products. inability to make the payment due to connectivity issues among others. This result is an indication that when users' expectations and needs are not met by ecommerce service providers, they tend to lose their customers' trust, and at the same time customers are dissatisfied. This result conforms to past findings on users' trust and satisfaction on e-commerce services (Ilumo & Yakubu, 2017; Flavia'n & Guinalý 2016).

The fifth objective was to determine the challenges users face in the use of e-commerce services. Findings revealed that users experience varying challenges on account of the operating environment and logistics problems faced by these e-commerce service providers such as the inability to locate customers' addresses, delay in product delivery, the problem of tracking ordered products, and connectivity issues among others. This finding also conforms to past studies on the challenges faced by users in the use of e-commerce services ((Agbata, 2019; Rinchi, 2019; Agboke, 2018; Kabugumila, Lushakuzi &

Mtui, 2016).

Conclusions

This study has demonstrated that despite the challenges faced by students in the use of e-commerce services, a moderate level of trust and satisfaction was exhibited. However, there is an urgent need for relevant stakeholders such as e-commerce providers and the government to address numerous challenges faced by users in the use of e-commerce services in Nigeria.

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Recommendations

Based on the findings of this study, the following recommendations are hereby made.

- i. E-commerce service providers should improve their security measures to enhance users' trust and satisfaction.
- ii. Frequent running of user surveys to rate the level of trust and satisfaction with ecommerce service providers. This will enable the e-commerce providers to constantly improve their service quality and delivery.

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Institutions and Resources for Effective Employee Training in the Public Sector in Tanzania

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Abstract

Over the years, the mainstream literature in human resource management shows that employee training especially in the public service does not reflect the actual skills gaps of the employees. Tanzania, like other developing countries experience similar problem despite the initiative taken by government through public sector reforms. The objective of this paper was to explore how policies and procedures together with the availability of resources, staff engagement and the exemplary management affect the effectiveness of training at the Public Service Commission in Tanzania. In doing this, the qualitative enquiry was adopted, and the Public Service Commission in Tanzania was selected as a case study. The actual research involved the review of important documents including the training policy, procedures, guidelines and budget and plan. The completion of review was followed by 66 indepth interviews with 45 respondents picked from different departments of the public service commission purposively. The review of documents was analyzed through content analysis and the interviews was coded and categories into themes through thematic approach for analysis. The findings indicate that various government documents including Public Service Act, regulations and standing orders provide the procedures for employee training in the public service. Nevertheless, the interviewed respondents were less aware of the issues pertaining to budgetary allocation for employee training. Apart from that, although many employees who attended the training were satisfied at the individual level, the training they received was not relevant to the commission in particular and public service in general. This was mainly attributed by the existing values and norms which bear on the belief that employee training is a source of fund and it is meant for the personal gain rather that the organizational benefits.

Key words: Public sector, employee training, public service commission, training budget, institutions for training

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Introduction

Employee training and development especially in the public sectors has been perceived as an instrumental for employee performance. Some authors like Beach (1980) viewed training as an organized procedure by which people learn knowledge and/or skills for a definite purpose. The training process therefore is one of the most pervasive methods for enhancing productivity of an individuals and communicating organizational goals to employees (Ekaterini, 2009).

There is already growing consensus in the mainstream literature of human resource effective management that training influences organizational performance. The main stance of the theory which leads to this argument is that different stages of systematic training and development such as need analysis, design of the training program, implementation and evaluation of the program have direct influence on employee performance (Graham and Benett, 1991). As a first step, training is conducted when a need to improve performance has been established and is established only when a difference is obvious between actual employee performance and pre-determined/desired performance (International Business Management, 2013). Therefore, training is done when there are indicators for training needs as indicated for example by production records, number of accidents, mistakes, expansion of operation, new technology, labor or employees' turnover, cases of promotion or advancements, new recruiters and transfers of staff (Graham and Benett, 1991).

The primary objective of training is to improve the knowledge and skills, change attitude and conduct of the employees with the goal that they can without much of a stretch adjust the new innovation in the

organization for generations. This is likely to reduce the wastage of time, cash and resources if employees are appropriately prepared. Besides, the training is perceived as an indicator for upgrading the prevalent skills, knowledge and capabilities of employees. This in turn bridges the gap between job requirement and employee present specifications which results into a powerful employee performance (Adesola et al., 2013).

Therefore, organizations need well trained staff in order to maintain and improve their competitive edge for an effective and efficient provision of quality product and services to their customers. This suggests that investment in employee training is inevitable if the organization wants to improve its performance and survive in competitive environment (Ngirwa, 2006 & Habi, 2013). Nevertheless, investment in employee training alone can not realize the intended goal unless the employees are engaged in the design and the actual implementation of the program. Besides, the managers in the organization must demonstrate a preferred and the expected behavior which the employees must imitate to ensure the effective transfer of the acquired skills and knowledge to the organization (Beatrice van del et al., 2009). Apart from that, the empirical literature by Wright and McMahan (1992) and Barringer and Milkovich (1998) show that the performance of employees is not only a employee engagement, function investment or exemplary leadership but institutional context. institutional context provides a strong framework to understand the human resources practices in organization of which the employee training is part of. This has been consistently confirmed by the empirical literature which shows that not all

human resources practices are the result of rational decision making. Some practices are influenced by institutional context outside the organization. Besides, the literature shows that institutional logics and institutional work which are the variants of institutional theory have greater influence on the practice of human resources training in organization (Zilber, 2013). Despite this recognition, there are few empirical researches which integrate institutional context and human resources training.

In Tanzania, since independence in 1961, the government has embarked on employee training for the purpose of improving their knowledge and skills to best fit the changing working environments (URT, 2008). In this regard, various institutions were created to serve this purpose. These include, the Tanzania Public Service College (TPSC), the Tanzania Global Learning Agency (TaGLA) and Institute of African Leadership Sustainable Development (UONGOZI Institute). These institutions were established to deliver different courses and programs with the overall goal of enhancing the technical, managerial and leadership competencies of the public servants (URT, 2013). Since then, various public servants have been trained in different courses to equip them with necessary skills and knowledge. Nevertheless, with all the efforts the government is putting in, there are still whistle blowers that public offices lack necessary skills to deliver to the expected standards (Mndeme, 2011). This creates a discrepancy of performance between what is actually performed as compared to what was expected for civil servants. Although many studies have concluded that the training procedure which includes systematic training and development improves performance, there

is little empirical literature showing how inadequate financial resources coupled with institutional context and complexities influence the effectiveness of public sector employee training in Tanzania. The goal of this paper is, therefore, to uncover the way which inadequate resources institutional context constrain the effectiveness of training and hence affecting the employee performance. Therefore, this paper asks: what are the resources, the policies and procedures governing employee training at the public service commission in Tanzania and how formal policies together with values and norms (elements of the intuitional context) influence the training of employees at the public service commission?

The Concept of Employee Training

The mainstream literature on employee training assumes that training is a compulsory learning process for human development. This process is coordinated towards acquisition of explicit knowledge and skills necessary for improving employee performance (Hafeez and Akba, 2015). This assumption suggest that the focal point of training is the job or task, for instance, the need for proficiency and wellbeing in the activity of specific machines or gear (Guay et al., 2000). Others like Laing (2009) perceive training as the marker to improve unrivaled skills, knowledge, capabilities and standpoint of the employees that outcomes in successful performance of the specialists but also training broadens the generation of the organization.

Therefore, training is a sorted-out inventory of expertise skills and knowledge required for individual staff to perform to the required standards. This implies that the acquired skills and knowledge aid the

employees to increase their ability which in turn influence their performance (Hafeez and Akba, 2015; Grobler, 2002). This therefore suggest that, the training needs to be created and rehearsed within the organization by acknowledging learning of theories and methodologies. It is indeed the kind of activity which is arranged, systematically and it results in upgraded dimension of expertise, knowledge and competency that are important to perform work successfully (Guest, 1997). This suggest that, employee training is a significant device to improve the workforce performance; it eventually builds the value of an organization yet should be balance among training worth and training dispensing (Singh and Mohanty, 2012). **Employee Training and Performance**

The mainstream literature on human resources management has confirmed the link between employee training and performance. For example, the empirical literature by (Khan, 2012; Mumanthi, 2014; Boateng ,2011) found that, training has solid connection with organizational performance and that the large training programs upgrade employee performance but also the empirical research by Githinji Angela, (2014); and Appiah, (2010) shows that managerial performance is an outcome of systematic training offered to employees and that training is a noteworthy indicator Therefore, performance. training upgrades knowledge, skills, properties and competencies which lead to employee performance and organizational productivity.

Nevertheless, employees training improves performance if the training project is connected to explicit employee and organizational needs (Beardwell Holden, 2013; Dewo, 2014). Kenny and Reid (2014) contended that a well-arranged training must have the accompanying

advances such as recognizing and defining training needs in order to realize the intended goal. Therefore according to them, a well arranged training must fulfill certain conditions: first, it must address the skills gap; second, it must articulate the learning required in terms of expertise, knowledge and attitudes but also objective of the training; third, it must build up a training system intended to address the issues and objectives; fourth, it must utilize the right training strategies but also choose who deserves the training and to whom training ought to be coordinated; finally, it must assess the training, revise and approve training if needed. Therefore, arranging for training needs to highlight the requirement for training and learning necessities (Jope, 2014). To this end, the literature provides the number of theory to explain this. These theories are discussed in details in the analytical framework section below;

Analytical Frame

One of the theories which are commonly used to explain the effectiveness of training is social learning theory. This theory suggests that the change of human behavior (employee behavior) is a function of interaction between cognitive behavioral and environmental determinants. This suggests that learning can be perceived as social interaction with other people (Illeris 2011). In this theory, two things are important: first the behavior and the characteristics of organization managers. This constitutes organizational environment in which the manager is supposed to be a role model through demonstration of exemplary leadership to his subordinates. Second, the theory provides the key tenets for the organization to realize the impacts of training which includes the demonstration of preferred

behaviors from which the employees can practice but also social learn and reinforcement for employees to adopt the preferred behavior associated with the transfer of learning at work place (Chowdhury 2006; Ashton, 2004) Therefore, this theory insists on the training as a tool to induce knowledge, skills, and capabilities to employees. This tenet is echoed in the mainstream literature on employee training which suggest that for organization to perform effectively in the competitive world, it must have well trained staff. This implies that investment in human capital have greater impact on the performance of staff in the organization (Fugar et al., 2013; Almendarez 2013; Fitzsimons, 2017; Gillies, 2017). Overall, the theory provides the general guidelines for the employer on how to develop the training programs which vield designed human capital in the organization (Booth and Bryan, 2005).

Finally, is the training engagement theory. This theory insists on the engagement of employees in the development of training goals, prioritizing of the goals and persevering of goals for the purpose of improving training effectiveness (Kenfer, 2012). The theory judge the effectiveness of training based on the extent to which employees complete training, report to their organizations as planned and increase their performance goals (Aguinis and Kraiger, 2009; Cascio &Boudreau, 2011; Ployhart and Hale, 2014; Sitzmann, 2012). To this end, the three dimensions: goal foundation, goal prioritization and goal steadiness are used as yardstick to judge the effectiveness of training. This is also associated with the appraisal of the necessities of organization the individual employee's motivation training. Apart from that, the three theories discussed above show that employee

training can further be explained by not only the social learning, human capital or employee engagement theory but also the institutional context within and outside the organization. According institution is a broad term which includes legislation, the formal structure of the administrative system (the distribution of responsibility) regulations and incentives (Hulst & Montfort 2011). It includes symbol systems, cognitive scripts and moral templates which provide a guiding framework for human action (Hall & Taylor1996). According to Acemoglu and Robinson (2017) institutions can be inclusive or extractive and if institutions are inclusive they can enhance the nation's growth and prosperity but also reduce poverty. This assertion has also been used to explain the variation of development between nations regardless of the similar geography or culture. So according to them, the exiting institutions in particular nations are important explanatory variable for the variation in nation's development.

On the hand, the theory shows that the behavior of individuals in organization is not full rational but bounded by their worldviews and that the choice of action is a result of situation interpretation and not purely instrumental calculations (Hall & Taylor, 1996). With respect to human resource management, and the employee training in particular, the institutional theory has been used to explain the performance of human resources practices in organization including training (Boselie, Dietz, & Boon, 2005; Wright & Ulrich, 2017). This theory argues that institutional context (formal rules, regulations, social values and norms) is necessary understand the nature and effectiveness of human resources practices. Therefore, this requires a deviation from a simple rationality model which focus on formal

rules and regulations and paying attention symbolic and political processes including norms values and constitutes institutional context (Cyert & March, 1963; Meyer & Rowan, 1977). This argument is also consistent with institutional logics perspective bv (Thornton, Ocasio, & Lounsbury, 2012) and a new focus on the micro foundations of institutions by (Bitektine & Haack, 2015; Powell & Rerup, 2017) which show that organizations are not only motivated by efficiency but also legitimacy in their adoption of institutional myths, rationalized institutional elements from their environment. With respect to the institutional context for employee training, the practice of the training follows policy and procedures which provides guidelines for the design and the implementation of training program in organization. It is a theory that when the requirement for training has been acknowledged, organization is required to have a general training policy to guide on the structure of training and development activities. But also it is a rule that the policy must be archived and shared with the organization employees (Clardy, 2008). In large organizations, a written policy conveys the expectations of training to the entire workforce, coordinating them into its endeavors and enable them in its execution.

A key issue to recollect when planning a training policy is that it ought to underline the goals and objectives of the training rather than the techniques and procedures. (Au et al., 2008) found that training approaches which spotlight on particular training strategies and procedures most of the time end up being far less viable than those which spotlight on the goals, the ideal results and impacts. In addition, public sector organizations often neglect to appropriately assess the genuine impacts of their training programs. For them, just directing the training is viewed as progress, and they once in a while look at what is accomplished by the trainees and what skills and data are moved to their job performance (Rinne et al., 2011).

Therefore, for the effective training program, the organization must consider training as an investment which needs resources as argued by human capital theory. Second, the organization must engage employees and other stakeholders in the planning and implementation for training as argued by training engagement theory. Third, the organizational managers must demonstrate an exemplary leadership to ensure the effective transfer of the acquired skills and knowledge to the workplace. Apart from that, for the effective training program the organization subscribe to the overarching institutional context which includes the government laws and regulations, the training policy and procedures and the informal social rules, values and norms which guide the behavior of the individuals and the organization

Methodology

To answer the research question stated in the preceding section which asks:

"what are the resources, policies and procedures governing employee training at the public service commission and how are the formal policies together with values and norms (elements of the intuitional context) influence the training of employees?", the study used a qualitative approach with a Public Service Commission in Tanzania as study. public service The commission is an independent government institution which is entrusted with power to regulate and ensure that public servants comply with human resource management rules and regulations. Nevertheless, the

commission experiences poor performance in human resources inspections and facilitations due to financial constraints but also inadequate qualified staff in different professions (URT 2016). Therefore, as a representative of public sector, a Public Service Commission was chosen because it is a public service institution responsible for supervision and management of public servants training and development in particular monitoring all issues concerning training policy and programs implementation in the public sector but at the same time it experiences the problem of inadequate qualified staff and financial resources to carry out its functions.

Data collection

The actual research began with the review of different documents which govern the training in the public sector such as the training policy, the guidelines for training, public service act and regulations, standing orders, quarterly and annual report of the commission, the budgetary and training program documents like MTEF book, TNA book, Training Program and training

reports for the financial years 2019/20, 2020/21 and 2021/2022. The completion of documentary review was followed by indepth interview. The procedure interviews began with the request for permission and the arrangement for the interviews time and place with participants. To this end, after the approval permission by public commission, a total of 45 respondents were selected purposely out of 111 employees of the commission. These participants were selected based on the position in the commission and the fact that they are largely informed about the training programs carried out in the commission, the procedures and the resources used for training. Besides the participants are in charge of supervising preparation of training budgets, training needs and the implementation of training programs. These include Secretary of the commission, directors of the departments. head of units, managers and lower cadre staff. Table 1 below shows the sampled respondents for in-depth interviews and their position in the Public Service Commission.

Table 1. The sampled respondents and their position in the Public service Commission

Department	Position of respondents	Total no. of staff	No. of respondents	No. of interviews respondents
Administration	Secretary of Public Service Commission	1	1	1
	Assistant secretaries	3	3	3
Human Resources and Administration	Director of Human resources department	1	1	1
	Senior Human Resource officers	3	2	3
	Human resources	10	3	5

	officer 1			
	Human resources	15	4	6
	officer 2			
Planning	Head of	1	1	1
Department	department			
	Senior planning	7	3	4
	officer			
	Planning officer I	10	3	6
	Planning officer II	11	3	6
Legal Department	Director of Legal	1	1	1
	Unit			
	Legal officers	5	2	3
	Assistant legal	10	3	4
	officers			
ICT department	Head of Unit	1	1	1
	ICT officers	11	4	7
Finance and	Head of Unit	1	1	1
Accounts				
Department				
	Senior Accountants	8	3	4
	Accountants	10	4	7
	officers			
Internal Audit	Head of Unit	1	1	1
Procurement	Head of Unit	1	1	1
Management				
Total		111	45	66

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The interview for each respondent took 50 minutes

to one hour and the interview sessions took place in their offices located at the head quarter of the public service commission. The themes of the interviews were organized around key themes including the current status of employee performance at the commission, the procedures used by the commission for conducting training needs assessment, the objectives and goal of the training, the practice of the training policy and guidelines and the reasons for their behavior which represent their values and norms. In total all these constitutes institutional context of the commission. In addition, the interview went further to find out the way the training programs are

funded in the public service including the allocation of budget for training. Finally, the data were analyzed through thematic approach in which the data were categorized

according to the number of themes which were used in the interview guide.

Procedures and policies for employee training at the Public Service Commission

To understand the procedures for employee training, the researcher reviewed the number of documents introduced in the preceding section. The review indicates that it is mandatory for the commission to conduct training needs assessment before taking employee for training. Nevertheless, the review shows that Public Service commission has not done any Training Need Assessment in the past five years. It shows that the present training needs assessment document (of 2013) does not match with the commission's strategic plan which was formulated in the year 2017 and the medium-term expenditure framework of the year 2019. This suggests that, the training needs analysis inventory is outdated since it does not reflect the current needs of the organization. Currently, the commission is implementing a new organizational structure approved in the year 2018 but the training needs assessment is still defining the former organizational structure which was used before October 2018 when the new organizational structure was introduced (URT, 2018).

Furthermore, the review and interview with the officials of the commission indicated that in this ongoing financial year 2021/2022, the commission management did not relay on the training procedure to decide about training needs. Instead, it is an individual employee's effort to champion for training opportunities. These findings are consistent with the research by Hamis (2000) concerning the effectiveness of training program for public workers at the ministry of health which discovered that there was training no program implementation, instead individual employees' effort to champion for training opportunities was what the ministry relied on to train employees.

Moreover, the commission does not have a training committee; instead, it is the Management which decides on training matters of the employees which is contrary to the needs of the Tanzania Training Policy of 2013. Besides, the reviewed documents show that the Commission's

annual budget set aside finances for staff skill development every year and the directorate for administration and human resource management has appointed a senior officer responsible for staff skill development (URT, 2013).

Besides, the researcher did not find training reports for those who went for training. suggests that mechanisms monitoring and evaluating activities of the commission were also not documented. This makes the whole training process ineffective and hence not easy to measure its output. In addition, the interview with senior managerial staff in charge of managing the Public Service Commission training program shows that the commission's training program does not suffice training needs of the employees as indicated in the interview with one of heads of departments which shows that very few staff are normally chosen for the training;

"The annual program provides limited chances for training to employees. For example the program provides a maximum of four (4) chances for employees training in local universities for long course and for some years there have been limited training opportunities owing to budgetary constraints." (Interview- Director of Human Resource and Administration department)

Allocation of budget for the Training

This section discusses the way the training program are budgeted and the associated challenges. In order to understand how the training program is budgeted, it was pertinent to review the document. The reviewed documents show that in every year the commission budgets for the skills development of the employees and the budget of the commission comprise the

entire budget of the ministry of public service which is approved by the parliament every year. The interview with senior official of the commission indicate that the training of public servants is not a discretionary matter but a constitutional as a well as a legal matter regulated by the public service act (Interview- Records Management Officer).

Furthermore, the research examined the sources of finances to support employee training. The findings indicate that Public Service Training Policy (2013) puts it clear that, it is the duty of every public institution to set aside sufficient fund for training. Based on this, the study examined the implementation of this policy component by the commission. The interview indicated that the public service has being financing the training in the public institutions but also some individual employees have been financing their training by using their own fund (Interview- Director Public Service Commission).

Building on that, the researcher went further to review the Public Service Commission budget for the last three years budget component evaluate financing training program and found that the annual budget of the Public Services Commission supports Training of public servants. The review of Medium-Term Expenditure shows that the estimated budget in the past three years was 259,600,000 but the released budget was almost half of the requested budget. The government does not release all the money requested and approved by parliament. As a result, the negative effect of under disbursement of the budget affects the implementation of the planned activities for the staff skills development for every financial year and hence limiting the implementation of training program as indicated in the table no.2 below

Table 2 shows the training budget of the commission and the type of training offered from 2018 to 2021

Financial Year	Estimated budget	Released fund	Long course training	Short course training
2018/2019	85,300,000	45,000,000	5	3
2019/2020	86,400,000	54,000,000	7	6
2020/2021	87,900,000	47,000,000	7	4

(TPSC Medium term expenditure 2021)

On top of that, 45 respondents who were interviewed indicated that the budgetary allocation for training of civil servants was insufficient. Only 16 respondents interviewed thought that the budget was sufficient. From these findings, it is very clear that budgetary allocation for training is not given the priority that it deserves. This view is further reflected during an

interview with one of the senior staff in the training section who had this to say:

"We all know the role that training plays for our staff, especially in the public services, but the biggest problem we are facing is budgetary cuts. We hardly have enough budget to cater for our training needs despite the importance of training in the public service" (Interview- Senior Human Resources officer- Directorate of Human Resources and Administration)

Type of training attended by different staff of the commission

To understand the different types of training attended by the staff of the commission, interviews were conducted with 45 respondents from different departments of the commission. In-depth information about the implementation of the training policy by the Public Service Commission was sought from respondents to find out if the policy administration was open or participatory involving employees of the Public Service Commission. The findings indicate that the employees were aware of the procedures to follow in order to attend training in public institutions. Only few respondents did not have enough knowledge concerning the procedures for training. This is also for by the Director supported Administration and Human Resource Management interviews below.

'I'm absolutely aware of the procedure for training which includes writing a letter to Commission Secretary requesting to go for training and accessing a chance in the institution where the course is offered but some staff are still unaware despite our efforts to educate them through meeting and general office announcement..."

(Interview- Director – Human Resource and Administration department)

Existing values and social rules in the implementation of a training program This section discusses the way the practice of training program deviates from the formal rules and procedures. To begin with, the research conducted interview with senior officials of the commission. The interview results show that the employees of the commission especially those who secure the opportunity for training attend the training program not because they want to gain more skills but because they wanted their salaries raised or get promotional

opportunities at their work stations. From this finding, it is pertinently clear that at the heart of training in the public service, lays selfish and personal interest motives the employees to attend the training. The self motivates for attending the training program is noticed at the beginning of the training program where the staffs fail to capture the goal of training because they are driven by self interest.

"We already know that when there are training opportunities, people tend to put their needs first as opposed to those of the employer (the government). This is human nature. Our needs come first"

(Interview- Human resource officer 1)

Moreover, with respect to monitoring and evaluation, the Tanzania Public Service Training Policy 2013 shows that the public service commission as a public service institution is responsible to manage training program through identification of training needs monitoring and evaluation as the core components of the systematic training development. To get more insight about this, the research asked about the actions taken by the public service commission leadership hold to staff accountable when in training and after finishing training. The interviewed respondents show that it is a rule for the staff to report to office during and after the completion of the training program but in practice there is a weakness in monitoring the training program especially the formal procedure to measure the benefits of training in an individual job performance. It was recorded:

"After one has completed training course, the office gets information through one's file in which all documents are filed but in practice very rare the staff submit all the required information in their files"

(Interview- Senior Human Resource officer)

Similar result was reported by Mndeme (2011) while evaluating factors limiting effective Training at TANESCO and Hamis (2000) at the Ministry of Health in his dissertation on effectiveness of Training Program. Both found that there was no program evaluation to measure translation of skills acquired during training into actual job performance. This makes the training program not effective since according to models of effective training program, it is mandatory for the training have comprehensive to monitoring and evaluation system for purpose of making training countable to the organization system.

Furthermore, the interview seeks to find out if the skills acquired by the employees improve their performance after the training and the social values or rules that play a role. Besides, the researcher was interested on whether it is the institution management or individual public worker who makes decisions on the best course to undergo training. The results indicate that, the employees undergo different types of training. The decision on which course to attend is done by both management and the employees. Concerning the use of the acquired skills after the training, the respondents argued that in the public service training, the employees motivated by benefits and that most of the employees go for training in order to get allowances. When they are back in office no body make follow up to assess their job performance (Interview - Head of Unit -Accounting Unit). This connotation is a contradiction to training policy which guides all Public Institutions Executive Officers to Implement, Monitor and evaluate their Training interventions (URT,

2013).

Apart from that, concerning the application for the skills acquired, the interview shows that the employees who went for training did not have the chance to apply the skills acquired or they did not find the skills acquired worth being applied to their respective places . But also some of them did not get the required skills because their minds was not concentrating. This serves to show that much as there might be some of tranings in the public sector, some people attend training for the sake of it, without necessarily intending to benefit the organisation. This kind of absurd trend was also amplified during interviews with Head of Legal Unit and Director of Human Resource and Administration.

Conclusion

Over the years, the public service commission realizes training as human capital and in doing that the commission has embraced this philosophy through the training policy and the implementation of different training programs. regulations require that the training of employees to follow they systematic procedures laid down in the policy document but that does not seem to materialize for some reason. One reason is the budget allocated for the training which is often insufficient but also another reason is the fact that the commission lacks the effective program for the transfer of the knowledge acquired through training and thus making the training acquired in the public service less beneficial. While there are complaints that training of public servants is under judged, and so there are insufficient funds, the study has shown that even with available funds, there is poor conduction of a training needs assessment. For instance, there is never comprehensive needs assessment which ought to be a must

before any training. This implies that some people attend training not because they want to improve their performance but because they want to meet their individual needs, as opposed to those of the commission. To be more precise, some employees attend training because they want their pay rises, promotions and job transfers. This makes the whole training exercise a mockery of the best human resources practices. This is consistent with Cyert & March, 1963; Meyer & Rowan, (1977) who argue that it is necessary to understand the nature and effectiveness of human resources practices and that the practice of employee training deviate from a simple rationality model and transcends into values and norms which constitutes institutional context. Therefore, the public service organizations should review and update their training needs assessment to make it a reality. This goes into three years training evaluation which does not seems to materialize because of lack of will to make follow up the employee performance after attending the training program. Therefore, there is an urgent need to increase the budgets for training in the public service, since training, if used properly, would be a cornerstone for improving the skills of the public servants but also the public service commission should design the effective mechanism for evaluating the training program which entails the performance which needs to be filled by the trained employees.

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Quality Analysis of Some Characteristics of Cement Using Cusum and Shewart Control Charts: A Case of Lafarge Elephant Cement

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Abstract:

This paper examines the quality characteristic of cement production in Nigeria in an attempt to understand some of the reasons of the rampant f collapse of buildings and lack of durable roads and bridges in Nigeria using Elephant cement produced by Lafarge company in Nigeria as a case study, the paper finds that the quality characteristics of Elephant Cement is under statistical control when analyzed using the Cusum and Shewart control chart. However, it is advised that cement companies adequately monitor the quality of their products and regularly service their production plants to improve cement quality.

Key words: Cusum Chart, Control limits, Defective

Introduction

Quality control (QC) focuses its attention on testing of products to discover defects and make report to management who takes the decision to either allow or deny the release. SPC is the statistical methods used in monitoring and improving the quality of the output of a manufacturing process, which also includes the use of quality control charts. Statistical quality control (SQC) is the term used to describe the set of statistical tools used by quality professionals for analyzing quality. The rate of collapse of buildings and lack of durable roads and bridges in Nigeria is a quality issue which this research seeks to examine. Cement production companies need to be adequately monitored and advised on when to service their plants and the right quality level of cement production to forestall further disheartening events in Nigeria. Cement is produced with many quality characteristics such as setting time of the cement (The time at which

cement completely loses its plasticity and became hard is a final setting time of cement), strength of the cement (The grades that corresponds to the minimum number of days-28 days for its compressive strength), soundness of the cement (soundness of cement is the ability of a hardened paste to retain its volume after setting) etc. Quality of Lafarge products sometimes fails to meet specification because of some assignable causes, operation errors, defective materials, manpower and other unassignable causes. In general terms, there are two enemies of product quality, and they are: deviations from target specifications and excessive variability around target specifications (Hill and Lewicki, 2006). Therefore, the tools needed in order tostudy and ultimately reduce the variation in a production process is the control charts. There are several control charts, the cusum, x-bar & s control charts will be discussed and used on some of the characteristics of cement production process.

Theoretical Framework

Huang and Shen (2011) did the analysis of variance for testing method of cement in grit of strength. It uses descriptive statistics, as the statistical tools which are full factorial design and analysis to identify the potential factors that impact the validity of testing method for determining the strength of cement. The results they got showed that the personal error stayed between both accuracy and precision of the Experimental time associated temperature vacillation resulted in strength variation but did not impact the precision of test in all curing ages. Different compression did not impact the precision of test but resulted in the strength variation on 3 days and 28 days significantly. Different methods for the initial moist air

curing significantly impacted the precision of testing method and resulted in the strength variation of cement on 1 day.

Gibb and Harrison (2010) did an analysis on the use of control charts in the production of concrete to check the condense strength for the concrete by making use of statistical tools like Shewhart control chart, Cusum control chart. In this paper the shewhart and cusum chart will be used to analysis the characteristics of cement and the analysis is will not be for only strength, but also for setting time and soundness.

Literature Review

Abariye (2016), stated that in the 1980s, during the economic recession which witnessed a decrease in the demand for cement that the supply gaps were still very much evident. The unpretentious but continuous growth in the Nigerian economy is a prospect for cement plants to increase local production. The rise in the demand for cement has led to a significant decrease in the quality of cement produced today in other to meet up this growing demand. The recent collapse of buildings in Nigeria maybe as a result of the inept of the contractors but can be major as a result of the quality of cement and other building materials used in the construction of these buildings. The rate of collapse of buildings in Nigeria has geometrically increased over time leading to the loss of lives and valuables. He concluded that the company focus more on production but neglected aspects of the quality of the product.

Bo (1962) concluded that one problem which constantly confronts the industry is control of quality. He commented on the specifications issued by the main control laboratory of Ideal Cement Company, that compressive strength should maintained. Because he found out that in reality the larger number is completely arbitrary, and the lower figure should be interpreted as a minimum specification requirement. He used Shewhart control charts but needed another chart to validate his findings.

Dimitris (2017) looked at several non-destructive assessment methods which have been developed. He stated that these methods are almost based on the fact that some physical properties of concrete can be related to the compressive strength of concrete. The Schmidt rebound hammer (SRH) and the ultrasonic pulse velocity (UPV) tests are combined to develop a correlation between hammer/ultrasonic pulse velocity readings and the compressive strength of the concrete materials. He too left the issue of the quality content unattended.

Skrzypczak, Kokoszka, Pytlowany and Radwański (2020) analysed the strength quality control of ready-mixed concrete for rigid tarmac using control charts. The results show that by combining the CUSUM control chart and the Shewhart control chart, higher accuracy of quality control analysis could be achieved, though CUSUM statistical analysis sensitive than the Shewhart control chart. Desmond (2016) developed a chart for assessing the in-situ grade strength of concrete. Four grades of concrete after the Nigerian General Specification for Roads and bridges (NGSRB-C20, C25, C30 and C35, is studied at different water-cement ratios for medium and high slump range. The concrete mixes are made from crushed granite rock as coarse aggregate with river sand as fine aggregate. He employed a simple algorithm using nonlinear regression analysis performed on each experimental data set produced Strength-Age (S-A) curves which were used to establish a quality control chart. It was revealed that

the absolute average error of estimate (Abs. EoE) recorded was less than $\hat{A}\pm 10\%$ tolerance zone for concrete works.

Layth and Harry (1988) proposed and illustrate statistical modelling and fitting of time-series effects on cement concrete and the application of standard control-chart procedures to the residuals from these fits. The fitted values can be plotted separately to show estimates of the systematic effects. Debasis and Goutam (2010), designed and apply a new cumulative sum procedure for the ready mixed concrete industry, which takes care of the risks involved in and associated with the production of concrete. A risk-adjusted cumulative sum model was developed by imposing the weighted score of the estimated risks on the conventional cumulative sum plot. This model is a more effective and realistic tool for monitoring the strength of ready-mixed concrete.

Pieter, Elias and Kolentino (2018) stated that early detection of low cement strength is important as continued production. It would result in large quantities of unusable cement and wastage to the environment. The paper stated that continued monitoring of the mean strength of cement in manufacturing is essential to avoid waste. Cumulative Sum (CUSUM) control chart was adapted together with regression analysis

Aleksandra, Mateusz, and Pawel (2018) used CUSUM and Shewart control charts to determine and the conformity of the hardened concrete with the parameters declared by the manufacturer. The research used a dynamic method of measurement by evaluating the change in the energy of the beater after rebounding from a given surface and conclusions were made based on the analysis.

Table 1: X and S values for setting time

Table 1: X and S values		Τ =
Date	X	S
10/1/2019	133.21	2.29309
14/1/2019	134.50	2.87563
18/1/2019	134.43	2.68082
22/1/2019	133.64	2.59013
26/1/2019	133.79	2.15473
30/1/2019	134.29	2.33464
3/2/2019	133.79	2.75062
7/2/2019	134.43	3.15532
11/2/2019	135.21	2.83328
15/2/2019	133.64	2.34052
19/2/2019	134.57	2.62281
23/2/2019	134.14	2.41333
27/2/2019	133.57	2.37663
2/3/2019	133.07	2.30265
6/3/2019	133.79	2.80600
10/3/2019	133.07	2.30265
14/3/2019	135.93	2.16490
18/3/2019	133.07	2.30265
22/3/2019	134.29	2.78536
26/3/2019	133.07	2.30265
30/3/2019	134.14	2.59755
3/4/2019	134.36	3.10353
7/4/2019	135.00	2.71746
11/4/2019	133.64	2.34052
15/4/2019	134.57	2.62281
19/4/2019	133.50	2.24465
23/4/2019	133.86	2.74162
27/4/2019	133.07	2.30265
1/5/2019	133.43	2.02729
5/5/2019	135.00	2.71746
9/5/2019	134.14	2.90509
13/5/2019	132.64	2.23975
17/5/2019	133.57	2.44050
21/5/2019	133.79	2.48623
25/5/2019	133.07	2.40078
29/5/2019	135.36	2.92488
2/6/2019	134.29	2.39963
6/6/2019	134.93	2.40078
10/6/2019	134.64	2.64886
14/6/2019	133.93	2.70226
18/6/2019	134.43	2.97979
22/6/2019	134.00	2.85549
26/6/2019	134.21	2.35922
30/6/2019	134.57	2.62281
		•

Monitoring The Setting Time

The \overline{X} & S and cusum charts will be applied to the data (appendix 1) using the mean and standard deviation values from table 1.

\overline{X} and S Control Chart For Setting Time

From the above table 1, the expression for \overline{S} stated in Eq. 15 and that of \overline{X} stated in

Eq.16 of this study are computed below and given as

$$\overline{S} = \left(\frac{3758.64}{616 - 44}\right)^{1/2} = 2.563 \text{ and } \overline{\overline{X}} = \frac{82567}{616} = 134.037$$

Using the expressions in Eq.14, the control limits for the \overline{X} and S charts are computed. The obtained limits are summarized in the table below (table2).

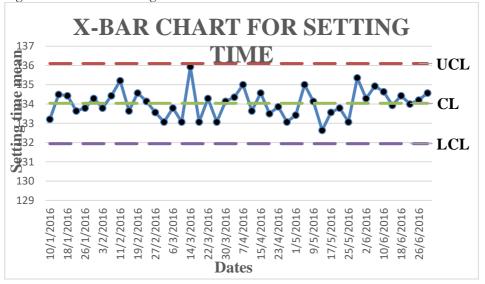
Table 2: Control limit value for setting time

N	A_3	B_3	B_4	UCL_S	LCL_S	$UCL_{\overline{X}}$	$LCL_{\overline{X}}$
14	0.8174	0.4051	1.5949	4.0877	1.0383	136.1000	131.942

On plotting the values of X and S in table 1 along with the control limits in table 2, the control charts for the X and S is obtained

and presented in figures 1 and 2 respectively.

Figure1: X chart for setting time



All plotted point's lies within the upper and lower control limit. If any point is below lower control limit (LCL), it indicates that the point is outside control limit ditto for upper control limit. The same setting is applied to figure II also.

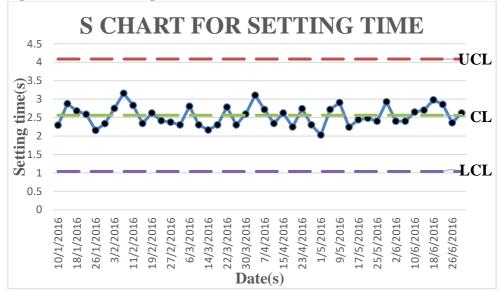


Figure 2: S chart for setting time

Cumulative Sum Control Chart For Setting Time

The cusum which was described in section 3 of this paper is used for monitoring the setting time, making use of the mean values in table 1. The overall mean as computed from table 1 is given to be $T = X = \mu_0 = 134.037$.

From Eq.5 in section 3, $\llbracket \mu \rrbracket$ _1is therefore 137.9564.

To determine the decision interval for the setting time is given as follows; Assuming, L 0=500

To find L_1, the compound value of B = 0.75

h = $((3.80 \times 2.6129))/(\sqrt{1})$ = 9.9291, as stated in Eq. 9

Thus, from Eq. 2, the cusum statistic is computed and shown in table 3 below and hence when $S_m>\pm 9.9291$, this is the signal that there is a shift in process mean.

Figure 3 below gives the cusum for the mean values of setting time

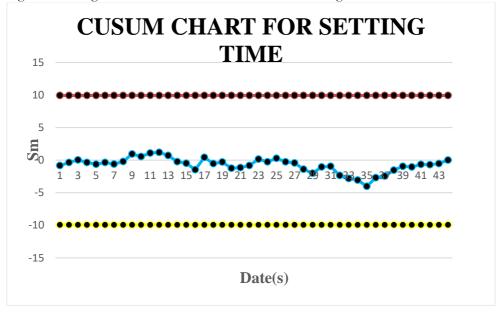


Figure 4:X chart for degree of soundness.

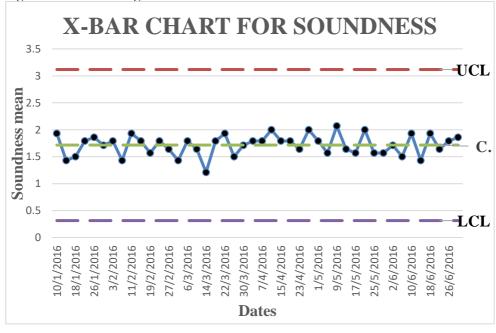


Table 4: X and S values for Degree of soundness

Date 4: A and 5 van	<u>X</u>	S
10/1/2019	1.93	1.89997
14/1/2019	1.43	1.34246
18/1/2019	1.50	1.55662
22/1/2019	1.79	1.62569
26/1/2019	1.86	1.74784
30/1/2019	1.71	1.20439
3/2/2019	1.79	1.76193
7/2/2019	1.43	1.60357
11/2/2019	1.93	1.32806
15/2/2019	1.79	2.00686
19/2/2019	1.57	1.34246
23/2/2019	1.79	1.88837
27/2/2019	1.64	1.78054
2/3/2019	1.43	1.45255
6/3/2019	1.79	1.96815
10/3/2019	1.64	1.90575
14/3/2019	1.04	1.62569
18/3/2019	1.79	1.0509
22/3/2019	1.79	2.36852
26/3/2019	1.50	
30/3/2019	1.71	1.60528 1.9779
3/4/2019	1.79	1.57766
7/4/2019	1.79	1.80506
11/4/2019	2.00	2.2532
15/4/2019	1.79	1.25137
19/4/2019	1.79	2.00686
23/4/2019	1.64	1.49908
27/4/2019	2.00	1.6641
1/5/2019	1.79	2.11873
5/5/2019	1.57	1.34246
9/5/2019	2.07	2.01778
13/5/2019	1.64	1.49908
17/5/2019	1.57	1.50457
21/5/2019	2.00	1.88108
25/5/2019	1.57	1.34246
29/5/2019	1.57	1.6968
2/6/2019	1.71	1.85757
6/6/2019	1.50	1.5064
10/6/2019	1.93	1.63915
14/6/2019	1.43	1.2225
18/6/2019	1.93	2.1649
22/6/2019	1.64	1.90575
26/6/2019	1.79	1.62569
30/6/2019	1.86	1.87523

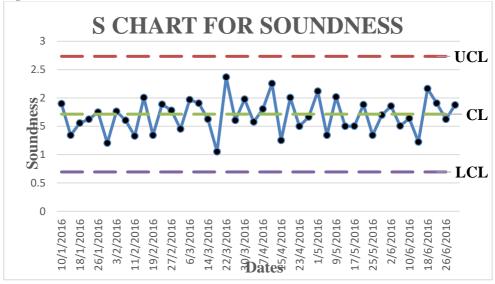
Analysis of Degree of Soundness Soundness of cement is the ability of a

hardened paste to retain its volume after setting. From the data given in table 2, the

mean values (\overline{X}) and standard deviation (S) values of the setting time are computed.

The obtained X and S values are presented in table 4.

Figure 5: S control chart for soundness



The cusum control chart in figure 5 obtained in monitoring the amount of strength gave an indication of a shift in the process mean. This shift occurred at about point 4 with an upward and downward movement and thus revealed several processes occurring. The cusum chart in addition, indicates no evidence of lack of control in the amount of strength in the process of cement. This therefore indicates that the process is in a state of statistical control.

Conclusion

Based on the analysis done in this paper, with the result discussed above, the process means in the setting timeand degree of soundness, in the production process of cement under study was found to be in statistical control, since both the Shewart and cusum control chart did fall within

control process mean.

The results of the current study demonstrated that it is feasible to use both the Shewart and CUSUM control charts. Both Shewart and CUSUM control charts can readily detect Out-of-control data points. The two control charts reported similar findings; this bring remedial actions plans which must be timeously to avoid waste which will eventually reach the environment.

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