AfRES

AFRICAN REAL ESTATE SOCIETY

21st Annual Conference

Theme:

Redefining the Future of Real Estate in Africa

Tuesday 6 - Friday 9 September 2022

Accra Marriott Hotel Accra, Ghana

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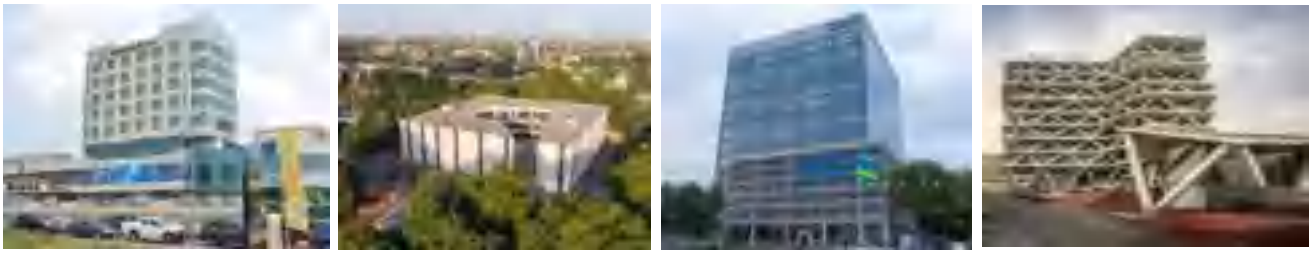

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Compiled by:
Lewis Abedi Asante & Emmanuel Kofi Gavu

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PREFACE

Dear colleagues from across the world. Akwaaba! And welcome to Accra Ghana.

It is a great privilege to welcome you to the 21st AfRES Annual conference taking place at the Accra Marriott Hotel in Ghana. We are grateful to our sponsors, partners, presenters and attendees without who the conference would not have been possible. We are very positive that the discussions during the conference will be of immense benefit to attendees.

The theme chosen for the 2022 conference is "*Redefining the future of Real Estate in Africa".* Undoubtedly the real estate industry plays a major role in the development mix in many economies. The recent global health pandemic has been an unprecedented disruptor in the world´s social and economic fabric.

The housing market has slowed down due to a decline in economic activities, employment and household incomes. The home office has become a critical extension of the office space in many organisations. Real estate professionals have had to adopt digital tools such as Skype, Google Meet and Zoom to conduct house inspection in order to minimize the risk of infection.

The implications of these dynamics will redefine the future of real estate in Africa and the rest of the world. The 2022 conference brings together real estate professionals, academics and other allied groups to discuss the changing dynamics of the real estate market, the emerging implications and the policy recommendations for governments, businesses and households.

This year we a high number of submitted abstracts at 85 abstracts and 30 papers for refereeing. We appreciate the Chair of the Scientific/ Technical Committee, as well as his team for their work in reviewing the submitted abstracts and papers. The feedback to the authors was very helpful in developing the papers and finalizing them in the format presented. The peer reviewed papers were double-blind reviewed to ensure high standards and international comparability, and also provide some guidance to authors. Some abstracts were declined as they were not appropriate for this conference.

The West African AfRES chapter is grateful to all those who assisted and contributed in bringing this conference together and making it happen. We are eternally indebted to the hardworking members of the local organising committee who took the task upon themselves and worked assiduously to ensure a successful conference. We say thank you and we appreciate your efforts and commitment to AfRES.

Emmanuel Kofi Gavu
On behalf of the Organising Committee
September 2022

AFRICAN REAL ESTATE SOCIETY (AFRES)

AfRES is the umbrella body for all real estate practitioners and academics in Africa. The Society organises annual conferences on thematic areas in selected cities across the continent. AfRES is organizing the 2022 conference in Accra, Ghana.

The theme chosen for the 2022 conference is "***Redefining the future of Real Estate in Africa***". Undoubtedly the real estate industry plays a major role in the development mix in many economies. The recent global health pandemic has been an unprecedented disruptor in the world´s social and economic fabric. The housing market has slowed down due to a decline in economic activities, employment and household incomes. The home office has become a critical extension of the office space in many organisations. Real estate professionals have had to adopt digital tools such as Skype, Google Meet and Zoom to conduct house inspection in order to minimize the risk of infection. The implications of these dynamics will redefine the future of real estate in Africa and the rest of the world. The 2022 conference will bring together real estate professionals, academics and other allied groups to discuss the changing dynamics of the real estate market, the emerging implications and the policy recommendations for governments, businesses and households.

The Annual Conferences serve as CPD programmes for participants. They also provide common platforms for sharing international experiences on best practices and in this case, issues such as appropriately dealing with the challenges in the real estate markets development would be the focus.
The conference location is in Accra Ghana. It was once the "Gold Coast" of Africa, for its extensive gold reserves. After independence from British rule, Ghana reverted back to its pride in the Ashanti Empire, renaming itself "Ghana" or "Warrior King" in Soninke language. Today it is considered the "Gateway to Africa" for its strategic position in the Gulf of Guinea, a few degrees north of the equator. Its location advantage has made Ghana and its ports, a critical base for connecting with the rest of the continent. Today, trade, commerce and entrepreneurial spirit mark the modern ethos of Ghana.

When you are in Ghana, you can expect your senses to be assaulted by the vivid expressions of a culture steeped in family values, ethnicity and gaiety. Everything is about colour and symbolisation. The Ghanaian love for life reflects in our choice of clothes and artefacts.

Visiting Ghana is more about the immersive experience than typical touristy sight-seeing. The country is a confluence of rich heritage, culture, pride and hospitality which welcomes you from the heart. Ghana has an abundance of natural beauty, and remote wilderness.

Come and experience the profound Ghanaian hospitality during AfRES 2022.
Akwaaba, and welcome to Ghana.

Emmanuel Kofi Gavu, *Dr.-Ing., MGhIS, MSc.(GIS), BSc.(Land Econs)*
On behalf of the Organising Committee
Accra, September 2022

THE CONFERENCE EVENT

AfRES is holding its 21st Annual Conference from 6th to 9th September 2022 at the Marriott Hotel in Accra Ghana.

The event is expected to host over 300 local and international attendees for an in-person conference after a break due to the Covid-19 pandemic.

For over two decades, our conferences have attracted representatives from all over the world especially members of sister professional bodies to discuss and present innovative solutions to real estate challenges especially with relevance to Africa. Professionals from real estate stakeholders, government agencies, academia as well as users of real estate services are encouraged to attend.

Conference format – In Person



Conference features:
Keynotes
Panel discussions
PhD Seminar
Launches and Awards
Parallel break-out session
Social events – site tours

ORGANISER

The African Real Estate Society (AfRES) founded in 1997, is a continent-wide organization that seeks to promote networking, research and education among real estate professionals across Africa.

It is affiliated to the International Real Estate Society (IRES), along with sister societies in North America (American Real Estate Society – ARES), Asia (Asia Real Estate Society – AsRES), Europe (European Real Estate Society – ERES), the Pacific Region (Pacific Rim Real Estate Society – PRRES) and Latin America (Latin America Real Estate Society – LaRES).

The warmth and mutual support amongst members and between sister societies is characteristic, and anyone who wants to contribute is welcome.

AfRES MEMBERSHIP

Membership is currently organised on three (3) regions:

1. Eastern Africa – Tanzania, Kenya, Uganda, Rwanda, Burundi, Republic of Congo, Seychelles, Eritrea, Djibouti, Comoros, Ethiopia, Sudan and Somalia

2. Southern Africa – Republic of South Africa, Botswana, Swaziland, Lesotho, Mozambique, Madagascar, Zambia, Angola and Namibia

3. Western Africa – Ghana, Nigeria, Mauritania, Senegal, Mali, Guinea, Burkina Faso, Cote D'Ivoire, Liberia, Sierra Leone, Togo, Benin, Cameroun, Chad, Central Africa Republic, Congo Brazaville and Gabon

LIST OF REVIEWERS

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Effah Amponsah	RMIT University
Daramola Thompson Olapade	Obafemi Awolowo University
Oluwaseun Damilola Ajayi	Oxford Brookes University

Conference Themes

- Affordable Housing/ Social Housing
- Sustainable Real Estate/ Smart Housing/ Green Building Initiatives
- Sustainable Financing/ Mortgage
- Real Estate Investment Trusts (REITs)/ PropTech
- Macroeconomic policy and Housing Developments
- Real Estate Valuation
- Land Administration and management
- CREM/ Property & Facility Management
- Real estate market research
- Research priorities for real estate education/ curricula

Best Paper Award Categories

- Best Investment Paper
- Best Sustainable Real Estate Paper
- Best Valuation Paper
- IFC EDGE Best Paper Award for Green Buildings
- Seun Ajayi Doctoral Dissertation Award
- IREBS Dupuis Award for Affordable Housing in Africa
- Dr Gisela Schulte Memorial Award for Women in African Real Estate

OPPORTUNITIES

Sponsors benefit when they partner AfRES during our conferences. These include:

- Increase visibility for your company and brand within an international audience.
- Possibility of targeted sales and offers to a unique group of professionals.
- Opportunity to showcase your products and services to a targeted audience.
- Reaffirm and improve company's reputation for success among existing/ new clients.
- Benefit from pre-event and post event exposure in terms of brand visibility.

We hope to hear from you soon.

We kindly request that you reach out to us with comments, questions, or tell us how you want to customize your sponsorship or add to the package in several ways.

CO-CHAIRS

Emmanuel Kofi Gavu *(Dr.-Ing., MGhIS)* is senior lecturer at the Department of Land Economy, KNUST Kumasi, Ghana. He is board member of the African Real Estate Society (AfRES), Chair of the Future Leaders of the African Real Estate Society (FLAfRES) and member Ghana Institution of Surveyors (GhIS). His research focuses on application of geographical information system in urban management, real estate and housing market analysis.

Emmanuel Tetteh Martey (PP, FGhIS) has held several positions within the AfRES, as Board Member, West African Chapter head, Vice President, President, Conference chair among others. He is a past president and Fellow of the Ghana Institution of Surveyors (GhIS). He is a practicing lawyer and the Chairperson for the Ghana Chamber of Construction Industry (GCCI). He is currently the Resettlement Manager on the Pwalugu Multipurpose Dam Project.

Call for Papers Key Dates*

Abstract submission (refereed papers) before **30th May 2022**

Abstract submission (non-refereed papers) before **27th June 2022**

30th June 2022 - Deadline for early bird conference registration/ paper presenters

Conference Registration Fees

Participants (early bird until 17th June 2022)	USD300
Postgraduate Students (early bird until 17th June 2022)	USD250
Participants (after 17th June 2022)	USD350
Postgraduate Students (after 17th June 2022)	USD300
Accompanying persons	USD250

*** Note – Conference Registration fee includes coffee breaks, lunches, cocktails and gala dinner provided during the Conference.*

Future Leaders of the African Real Estate Society (FLAfRES)

How far we have come

With a decline in new membership, an ageing membership and a seeming lack of succession plan as challenges facing the African Real Estate Sociey (AfRES), the FLAfRES was inaugurated as a potential solution. The idea was that a youth-led committee within AfRES would appeal more to younger members in terms of volunteering their time for the organisation. The target was early career academics, researchers and professionals.

There was an urgent call to encourage younger colleagues to join the association to ensure sustainability and growth. This was achieved through the institutionalization of our flagship mentorship programme that pairs early career academics, researchers and professionals to senior colleagues within the organisation. The main object was to promote volunteering and mentoring the next crop of AfRES leaders and promote active participation among younger members. Volunteering activities include serving on seminar and conference organizing committees, seminar and conference supporting staff, editorial and logistics support during AfRES related programmes.

Another opportunity to train younger members is the feedback given to younger members who publish with the Journal of African Real Estate Society (JARER). JARER has a strong developmental dimension that mentors emerging African researchers. The journal offers quality feedback and support from the peer-review and publication process.

The first meeting of FLAfRES was held on 11th September 2019 in Arusha Tanzania. The meeting recorded 20 attendees. Currently (December 2021) FlAfRES has an active WhatsApp membership of about 100 participants. This in our opinion is a complement to the AfRES organisation in terms of new membership. We salute our founding directors Omokolade Akinsomi (currently the AfRES President), Emmanuel Kofi Gavu (currently the FLAfRES Chair and AfRES West Africa Vice-Chair) and Tayo Odunsi (currently the FLAfRES Vice-Chair) for charting this path. It is our hope that this committee will grow in leaps in bounds to serve as a solid backbone to sustain AfRES to the next generation.

Emmanuel Kofi Gavu, *Dr.-Ing.*
(FLAfRES Chair – 2021/2022)

Local Organizing Committee

Dr.-Ing. Emmanuel Kofi Gavu (MGhIS)
AfRES 2022 Conference Co-Chair
Senior Lecturer, Dept. of Land Economy
KNUST, Kumasi Ghana

Emmanuel Tetteh Martey (PP, FGhIS)
AfRES 2022 Conference Co-Chair
Resettlement Manager
Pwalugu Multipurpose Dam Project, Ghana

Esther Nahrkwor Terkper (MGhIS, Mac)
Estate Surveyor
VRA (Corporate Estate Management)

Abena Tweneboah Danso (MGhIS)
Valuation and Estate Surveyor

Surv. Dr. Mrs. Victoria Aboah (FGhIS)
Executive Director
Diamond Consult and Estate Development

Surv. Edward Sarpong (MGhIS)
Estate Officer
Volta River Authority, Ghana

Dr. Lewis Abedi Asante (MGhIS)
Lecturer
Kumasi Technical University, Ghana

Surv. Randy Alao (MGhIS)
Principal Land Administration Officer
Lands Commission Ghana

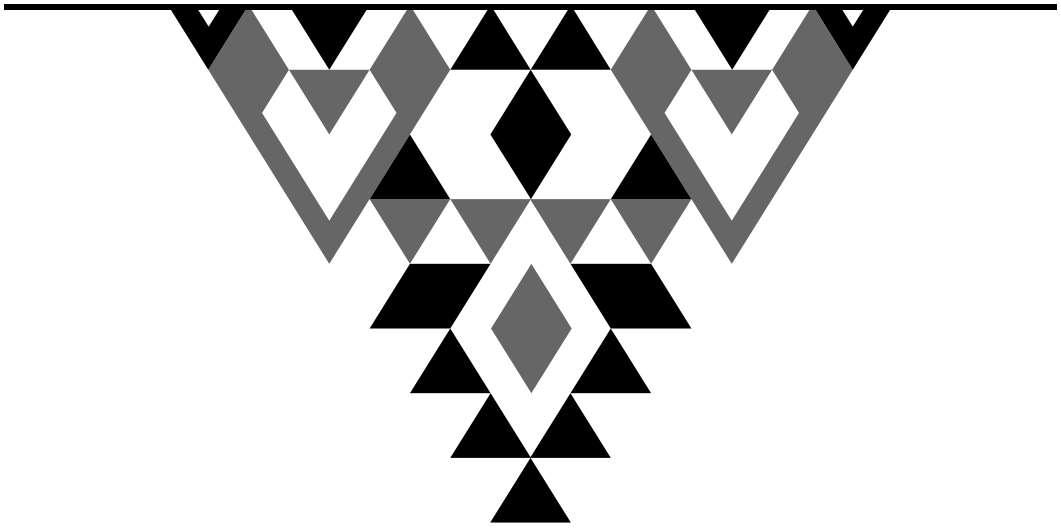
Future Conference

2023 AfRES Conference

Nairobi Kenya

www.afres.org

ABSTRACTS



LEVEL OF EDUCATION, GENDER DIVERSITY AND REITS PERFORMANCE

Oluwaseun Ajayi and Omokolade Akinsomi

Abstract

Purpose – The purpose orelationship between the level of education, gender diversity and Real Estate Investment Trust (REIT) financial performance.

Design/methodology/approach – The authors employ ordinary least square regressions on an unbalanced panel of South African REITs for the time period from 2013 to 2021. The paper adopted returns on asset (ROA) as the measure of performance; this was regressed alongside control variables that indicates that REIT promotes diversity in management.

Findings – The results indicate that REITs that promote the appointmf this paper is to examine the ent of board directors with higher educational qualifications have higher financial performance than comparable counterparts. We also find evidence of an insignificant relationship between gender diversity and REITs financial performance; meanwhile, we found a significant relationship between female directors' level of education and REITs performance.

Practical implications – The analysis indicates that while gender diversity may be insignificant, higher educational qualifications among male and female directors has to be more attractive among REITs for their positive financial results.

Originality/value – This paper contributes to the literature by investigating whether the level of education and gender diversity have an impact on REIT financial performance.
Keywords Education Attainment, Gender diversity, REIT financial performance

DOMESTIC BIAS VS FOREIGN BIAS? EVIDENCE FROM REITS

Omokolade Akinsomi[1], Mabuse Moja[2], Frank Ametefe[3] and Yasushi Asami[4]

[1]*School of Construction Economics and Management, University of Witwatersrand, South Africa*
[2]*Lena Capital, South, Africa*
[3]*School of Construction Economics and Management, The University of Cape-Town, South Africa*
[4]*Department of Urban Engineering, School of Engineering, The University of Tokyo, Japan*

Abstract

This paper examines the performance of domestic-bias and foreign-bias REITs in South Africa. For instance, in South Africa, recently, REITs management has made investment decisions to invest outside the shores of South Africa to optimize returns. We, therefore, examine the monthly returns of South African REITs from 2013 to 2021 and construct equal-weighted and value-weighted indexes for domestic domiciled REITs and REITs that invest in properties outside of South Africa. We compared the indexes of these portfolios to determine the impact of foreign investment by South African REITs. Our findings would assist investors and fund managers make better-informed decisions in the area of portfolio selection and management.

Keywords: Diversification; South Africa; Real estate investment trust, Offshore Investments JEL Classification: C22; C30; R00; R20. Corresponding author: Omokolade Akinsomi, kola.akinsomi@wits.ac.za

CLIMATE RISKS AND ITS IMPLICATIONS ON REAL ESTATE INVESTMENT IN EDO STATE, NIGERIA

***AKINWAMIDE, David Oluwatofunmi[1], Jonas HAHN[2], Partson PARADZA[3] and Oluwatosin Miracle ATEWOLOGUN[4]**

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[4]Department of Pure and Applied Biology, Ladoke Akintola University of Technology, Nigeria

Abstract

Climate change and its associated impact on environment has been a topical issues globally. Considering the "E" of the Environment, Social, Governance (ESG), building climate intelligence is central to value creation and strategic differentiation in the real estate industry. This study therefore examines the perception of real estate professionals on the risks of climate change and its effect on real estate investment in Edo State, Nigeria. Structured questionnaires were purposively administered to 75 selected Estate Surveyors and Valuers in Benin Metropolis while all retrieved questionnaires were found suitable for analysis. Descriptive statistics was employed to analyze the data collected from the respondents. The results depicted that more frequent and intense extreme weather events, extreme rainfall, gradually changing climate (e.g., temperature, precipitation), flooding, and rising fuel prices were the most perceived risks of climate change in the study area. Furthermore, higher construction cost (due to adaptation), infrastructural damage, health hazard, loss of income, deterioration, reduction in property life span, increase in maintenance cost, and obsolescence were the perceived effects of climate change on real estate investment. It is therefore imperative for real estate players (such as investors, professionals, regulatory bodies etc.) to understand the climate risks (both physical and transition) in real estate market and adopt a mitigative strategies (such as green building initiative) to avert the effects on real estate investment in Nigeria.

Keyword: Climate Change, ESG, Environment, Real Estate Investment, SDGs 13, Nigeria
*Corresponding author: oluwatofunmidavid@gmail.com

A REVIEW OF REAL ESTATE PORTFOLIOS OWNED BY DC PENSION FUNDS IN KENYA

Naburi Ayub and Ametefe Frank

Abstract

One of the primary objectives of investment policies for retirement benefits funds especially DC schemes is to maximize the returns on investments within the risk constraints and levels acceptable to the board of trustees. Investments into the real estate sector by DC schemes has been growing over the last couple of years. This study addresses three critical questions. What is the growth rate of Real Estate Portfolios owned by DC Pension Schemes? What are the returns from Real Estate Portfolios owned by DC Pension Schemes? Is the growth of Real Estate Portfolios based on return on investment?

Descriptive statistics will be performed on the data to summarize the variable data therefore facilitating its understanding. The descriptive statistics selected for this study includes the mean, standard deviation, frequencies, maxima and minima. The analysis of trends in composition of real estate portfolios in annual valuations of pension funds and annualized total returns of property portfolios will be conducted. The total annual returns consist of rental yield and capital appreciation (obtained from fair market value gain). An annualized total return is the geometric average of the amount of money earned by a portfolio each year over a given time period. The Weighted Average Annualized Property Portfolio Returns from 2012 to 2021 will then be computed in order to answer the three research questions.

The results will redefine the future trends in property investments by DC pension schemes and consequently the larger real estate industry given the significant role of pension schemes in the economy. This study will provide information to trustees and fund managers to guide the real estate portfolio selection and allocation in order to optimize the returns on investments in DC pension funds.

Keywords: DC Pension Schemes, Return on Investment, Real Estate Portfolio, Allocation & Selection.

UNPACKING HOUSING WAITING LIST AS A CRITICAL POLICY INSTRUMENT FOR PROPERTY THE LADDER IN BULAWAYO, ZIMBABWE

Romeo S Chasara and Aly Karam

Abstract

This paper provides a critical examination into the functioning of a housing waiting list document, a critical instrument for the delivery of affordable housing in Zimbabwe's local municipalities. It argues that the housing waiting list document is opaque and has on one hand, made it difficult for poor families to access public housing, while on the other hand, has also accelerated the delivery of public housing to a certain segment of the society that has political capital. Affordable housing is part of the process of getting poorer households on the first step of the ownership ladder and into the property market. If there are prejudices in the process, it leads to unequal entry into the property market for the poorer segment of the population, hindering their economic progress.

The research brings into the conversation the concept of ungovernability popularised by Roy (2009 and Bénit-Gbaffou (2018) to mean the inability to govern. It makes a case that the way in which the housing waiting list is promulgated, used and stored is one of the reasons why access to affordable housing has remained a challenge in cities of the South. The ungovernability of public housing is a deliberate attempt by local governments to achieve certain ends which include but not limited to build support base for political parties, wealth accumulation and maintain cliental relationships by facilitating their entry into the property market. Thus, the failure to delivery public housing has seen local governments 'meddling through' (Bénit-Gbaffou, 2018), rather than governing the housing sector and providing for the poorer segment of the population.

THE NEXUS OF PRIVATE, STATE AND CUSTOMARY TENURE REGIMES: ASSESSING THE RIGHTS OF ARTISANAL FISHERS IN THE KAFUE FLOODPLAINS OF ZAMBIA

Christopher Mulenga and Sam Mwando

Abstract

Zambia is endowed with approximately 12 million hectares of water in form of rivers, lakes, and swamps and 8 million hectares of wetlands (IAPRI, 2015; Haller & Merten, 2008; Musumali et. al., 2009). According to the SADC fact sheet of 2016, Zambia produces 106,798 tons of fish annually and employs about 325,000 people. The contribution of the fisheries sector to rural economic growth and commerce provide significant economic opportunities for the rural poor (Musumali et. al., 2009). Despite such natural endowments, Zambia remains one of the poorest countries in Africa. This socio-economic situation in the country is worse in rural areas of the country. There is increasing evidence that secure access to land based resources is a prerequisite for livelihood security and development (FAO, 2013; Bugri, 2008).

This study investigates the state of marine and property rights within three fishing camps under customary jurisdiction of Muwezwa (Namunyona and Musozya) and Shakumbila (Namucheche) chiefdoms. The study further investigated the extent to which customary laws is recognised as an integral part of the legal framework. The fishing camps are occupied by local communities that have lived in the area based on customary norms and traditions without any documentation. This is despite the area becoming a hive of economic activities supporting both the local economy and nationally. The Kafue floodplains also attracts private companies who acquire land for tourism purposes.

The study involved quantitative and qualitative methods. We collected information using a household survey in the selected villages. The survey was structured to collect detailed information on household main activities, socio-economic characteristics. The survey included questions regarding the property and marine rights of permanent and seasonal residents in the sampled villages.

Key Words: Tenure security, customary land, marine resources, livelihood security

IMPLEMENTING INSTITUTIONAL REFORMS FOR SUSTAINBLE GOOD GOVERNACE IN LAND ADMINISTATION AND MANAGEMENT-UNDER “THE LANTERN'' OF CHANGE MANGEMENT TOOLS, TECHNIQUES, TIPS AND TRICKS

David Kwesi Dautey-Land Economist

Abstract

Universally, It is acknowledged that land together with its resources form the bedrock of the development of a country. It is a key factor in the fight against poverty alleviation. Our land is our heritage. It is the embodiment of our physicality and spirituality. It is our essence, and a veritable source of our livelihood and wealth creation. The land mass of Ghana with a total area of 238,553sq.kms contributes our political sovereignty,, the foundation of our socio-cultural values and economic power. Indeed, the centrality of our land to our socio-economic development is tied to our natural resources endowment. These resources which include mineral, forests wetlands, water bodies underpin our existence as a people. Their sustainable and responsible management and administration and equitable distribution of the benefits are essential for sustainable livelihoods.

With a strong natural resource base, our economy is basically a land based economy which supports a population of about 31,732,129 (UN estimate 2021). It is estimated that about 136,000km2 of land covering 57% of the country's is classified as ''agricultural land area'' Approximately 52% of the labour force is engaged in agriculture. This sector, it is estimated contributes about 54% of the country's GDP, accounts for over 40% of our export earnings. The Forestry sector contributes about 6% of the GDP, 11% of export earnings and contributes about 100,000 for the labour force employment (FAO 2010). The Mining sector contributes 2% of GDP and 28.3% of Government revenue (GSGDA 2014-2017)

In spite of the importance of land in our national economy, the administration and

management of land and land resources have been confronted with numerous challenges among which lack of consultation with key stakeholders in the area of compulsory land acquisition and delay in compensation payments, legal pluralism, indeterminate customary land boundaries, lack of accountability, probity and transparency on the part of some traditional authorities in the management of land and its resources, fragmented institutional arrangements with weak capacity.

In the natural resources arena, it has been estimated that environmental degradation costs between 5-10% of the GDP and with this the Forestry sector accounts for 63% (USD$ 500 million of the cost-Forestry Commission 2010).

Since the 1990s the country lost more than 33.7% of its Forests (FAO). The rate of deforestation between 2005 to 2010 was estimated at 2.19%- the 6th highest rate globally for the period (FAO).

Illegal mining also results in huge sums of lost revenue. In 2016 alone, an estimated $2.3 billion worth of gold left the shores of Ghana through galamsey. The illicit trade avoids taxation and the prevalence of foreign actors means that profits typically flow out of the country. Despite its importance in the country's socio-economic development, its negative impact on the country's environment is evidenced in water pollution, destruction of flora and fauna, land degradation and metal contamination of our soils.

Good governance occupies the central stage in the discuss in land administration and management. Failings in good governance have adverse consequences for society as a whole, Good governance can help achieve economic development and poverty alleviation. Any Institutional reform involves changing the status quo and in this resistance cannot be ruled out Successful institutional reform can be achieved through the appreciation and application of Organizational Change Management tools, techniques and resistant management.

Keywords: Land Administration and Management, Governance, Sustainable Development, Project Change Triangle (PCT), Fundamental Change, Resistance.

SOUTH AFRICAN REITS PREFER THURSDAYS AND FRIDAYS

Ajayi Oluwaseun Damilola., Gavu Kofi Emmanuel and Iheanacho Munachi

Abstract

Purpose: The paper examined the presence of day-of-the-week effect on returns of different classifications of South African REITs.

Methodology: The ordinary least square regression (OLS), generalized autoregressive conditional heteroskedasticity (GARCH) (1,1) (2,1) and Kruskal-Wallis (KW) test were utilized on data obtained from the IRESS Expert database from 2013 till 2021.

Findings: The best day to invest in office, diversified and industrial REITs was Friday, Thursday and Friday respectively. Wednesday was found to be the least profitable day as it had the least average daily return while Tuesday was the most profitable day with the highest average daily return. REITs were traded the most on Friday while REITs were least traded on Monday. Returns were most volatile on Monday while volume was least volatile on Thursday. The KW test revealed a statistically significant difference between the median returns across the days of the week. Based on findings, the best day to invest in office REITs is Friday, diversified REITs (Thursday), and industrial REITs, Friday.

Practical Implications: By recognizing the day-of-the-week effect, investors can buy/sell South African REITs more effectively.

Originality: This paper apart from being the first in the context of South African REITs, brings updated evidence of the contested calendar anomalies issues.

Keywords: day-of-the-week effect, efficient market hypothesis, market liquidity, Kruskal Wallis, GARCH, REITs

Paper type: Research paper

REVISITING AFFORDABLE HOUSING STRATEGIES IN AFRICA: THE SOCIAL JUSTICE CASE

Komu, Felician

Abstract

The quest for affordable housing in Africa has never been an easy task nor successful one. Some of the strategies have addressed social justice marginally while some have not. It was intriguing therefore to reflect on these strategies with a view of determining viable mechanisms for a just and sustainable housing delivery in Africa. The paper discusses the significance of land governance and institutional framework for the delivery of housing in the context of the scarce land resources on an equitable basis and abiding with the principles of social justice and livelihood rights. The paper posits just access to land is a difficult concept to decode in urban contexts.

The key arguments pursued in the paper are based on the concept of 'just city' with special focus on land and housing. The ideal just city is where there is social justice which seeks equal distribution of opportunities, rights, and responsibility irrespective of physical characteristics of the urban area, nature and job locations, and social behavior of the city's dwellers. The three central principles of Just City, 'Equality', 'Democracy' and 'Diversity' as espoused by several scholars in city planning, housing, employment, urban economy, and poverty are examined. Reflections are made on the several initiatives to promote a just city where the right to access land and quality housing has been the prerequisite such as the 'Social Justice Coalition' in South Africa, 'Know Your City' and 'smart urbanism'.

This paper is based on desk-top reviews, to explain how households and communities obtain access to land for housing both in the formal and informal arrangements, the extent to which their rights and dignity are addressed, and whether they are fairly treated in the process.

Key words: Affordable housing, social justice, just city.

AN ANALYIS OF ESG REPORTING BY SA REITS

Francois Viruly

Abstract

REITS are increasingly expected to adopt on ESG interventions and to report on sustainability activities. There is a growing emphasis on the determination of non- financial reporting standards which are presently being adopted by entities such GRI and IFRS. The research shows what aspects of ESG South African REITS are reporting on and whether this is being undertaken in a consistent manner and based on specific standards.

MORTGAGE FORECLOSURES IN GHANA: THE LAW, PRACTICE AND IMPLICATIONS

Gyamfi-Yeboah, Frank

Abstract

Historically, the mortgage market in Ghana has been bedeviled by notoriously long delays in foreclosure proceedings. The delays have largely been attributed to the inefficiencies in the judicial system as the country primarily operated under the lien theory, which requires lenders to enforce their rights over the collateral under the supervision of the courts. However, the passage of two key legislations (Borrowers and Lenders Act and Home Mortgage Finance Act) in 2008 has sought to fundamentally alter the mortgage foreclosure procedure in Ghana. In particular, both legislations allow lenders to foreclose without resorting to court processes so long as they are able to obtain possession in a peaceable manner. Notwithstanding these provisions, anecdotal evidence suggests that the use of court proceedings remains the predominant means of foreclosure. In this paper, I examine the provisions in the Home Mortgage Finance Act and Borrowers and Lenders Act relating to mortgage foreclosures and investigate the effectiveness of the provisions in affording lenders an expeditious foreclosure process.

SHAPING THE FUTURE OF CUSTOMARY LAND SECRETARIATS IN GHANA

Akwensivie, Gad Asorwoe, Coleman, Clarence Bosompim and Dzradosi, Sylvia Fafa

Abstract

Customary Land Secretariats in Ghana have been in operation for close to two decades. They were introduced as part of the implementation of the Ghana Land Administration Project to help improve upon customary land management and administration at the customary level, bearing in mind their potential to aid the public land sector agencies particularly the Lands Commission, the Office of the Administrator of Stool Lands and the Land Use and Spatial Planning Authority achieve their respective mandates. This work reviewed the operations of existing Customary Land Secretariats vis-a-vis their mandates as prescribed and outlined in the Land Act 2020 (Act 1036) in terms of dispute resolution, recording of customary land grants, coordination and collaboration with stakeholders. The work assessed their overall impact on customary land management. The work lays out the implementation successes and challenges and makes recommendations towards improving their effectiveness. Overall, the work concludes that, Customary land Secretariats if well-resourced have the potential to instill discipline in the local land market by regulating abuse of authority by some customary land authorities particularly chiefs, clan and family heads and tendanas. The work also reviewed progress on the resolution of land related disputes via Alternative Dispute Resolution. Finally, the work makes recommendations with far reaching implications for the existing, new and yet-to-be-established Customary land Secretariats.

WAREHOUSE REAL ESTATE: THE NEW KID ON THE INDUSTRIAL BLOCK

Waswa, James

Abstract

The paper assesses the worldwide trend among different property markets, with investors putting in significant resources into the warehouse market. We also analyze whether the warehouse sub-market will replace the traditional industrial market in the long-term.

ANALYZING THE RELATIVE ENVIRONMENTAL IMPORTANCE OF THE TANZANIAN GREEN BUILDING ELEMENTS

Leonard Emmanuel Mwassa and Sophia Marcian Kongela

Abstract

The environmental pollution contributed to by the building construction sub-sector in Tanzania is significantly soaring by the day, making it difficult for the country to align to the expectations of the Global Development Agenda, 2015. This article focuses on the establishment of environmental importance weightings for local green building standard elements in Tanzanian, to be able to match the pace at which the global green building sector is moving. Emanating from the use of a Relative Importance Index (RII) analysis, the study found that, similar to the global practice of green building certifications, which assign more environmental weighting to energy efficiency in green buildings, the same way have the RIIs of the examined Tanzanian Green Building Assessment criteria identified energy efficiency (with the highest environmental importance weighting given by RII = 0.78039216) as the most important ingredient of green building. Although it is not the case in other global green building certifications, for the case of Tanzanian Green Building Standard elements, Water Efficiency and rainwater harvesting, as well as on-site waste management and environmental conservation emerged as the twin-second best elements (receiving the same environmental weighting given by RII = 0.76470588. On the other hand, the study revealed that Building Automation and Internet of things (in other words referred to as innovation in buildings) as the least environmentally important element with the lowest environmental weighting given by the RII = 0.61568627, which in some ways confirms and questions the environmental weightings allocated to 'innovation' green element by the most prominent global green building certifications such as LEED, BREEAM, Green Star Australia, Green Star SA, and Green Mark

AN ASSESSMENT OF MAINTENANCE CULTURE IN MOSHOOD ABIOLA STADIUM, NIGERIA: THE FACILITY MANAGEMENT PERSPECTIVE

Kehinde Ogunsanya and Dumebi Efoobi

Abstract

The Nigerian Government invest so much in sport facility and development of infrastructure but lack good maintenance culture to preserve the lives and fabrics of these infrastructure. In many sport facilities across the nation, there has been little or no adoption of a proactive facility maintenance culture. In such situations there is a risk that the facility deteriorates more rapidly than expected, leading to expensive maintenance and repair charges. Some of the reasons adduced to poor maintenance culture in sport facility in Nigeria are lack of fund and total negligence. So much emphasis is placed on aesthetics and infrastructures such that the maintenance takes the back seat. This study examines maintenance culture adopted for Moshood Abiola Stadium in Abuja, Nigeria from the perspective of facility management. The study further assesses the economic values loss as a result of poor maintenance culture on this facility. The study adopts the use of a structured questionnaire that explains the significance of good maintenance culture in sport related facility. Findings were validated and supported by case study projects. This research equally recommended ways of improving maintenance culture in Moshood Abiola Stadium with the view of maximizing return on investment in sport facility in Nigeria.

Keywords: Maintenance, Maintenance Culture, Sport Facility, Facility Management, Moshood Abiola Stadium.

ANALYSING (A)SYMMETRIES IN STUDENT ACCOMMODATION PRICING: EVIDENCE FROM EUROPEAN STUDENT ACCOMMODATION MARKET

Oladiran, Olayiwola and Abbas, Muhammad

Abstract

This paper examines the relationship between student housing attributes and the pricing of student accommodation. The paper further explores the asymmetries in pricing for Purpose-built Student Accommodation (PBSA) and Private Student Accommodation Providers (PSAP). We utilise a web scraping procedure to access online-listed property information and prices from 25 major student destination cities in Europe on student.com and Study Abroad Apartments. Using machine learning methodology, we analyse some key tangible and non-tangible features of the properties and explore their relationships with the listed price. We also examine the potential effects of economies of scale through variations in the pricing mechanism for PBSAs and PSAPs.

The results show that the non-tangible property attributes have a stronger relationship with student accommodation prices in comparison to the tangible attributes. We also observe that the influence of these non-tangible property features on student accommodation prices is significantly stronger for PSAP properties in comparison to PBSA properties. The results suggest that through the economies of scale mechanism, institutional investors may be able to provide some facilities in their PBSAs at lower costs than PSAP investors and this may result in lower premiums for these facilities as reflected in the pricing. From a methodological point of view, we show that the use of asset features and historic pricing trends can enable the training of various supervised machine learning algorithms which in turn can improve asset pricing, taking account of institutional and non-institutional investment types.

BRIDGING THE GAP IN REAL ESTATE EDUCATION AND MARKET GROWTH IN GHANA

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Abstract

Over the years, Ghana's real estate industry has seen tremendous growth and expansion. The increased participation of locally based property developers and foreign real estate firms in core real estate development is impressive. However, real estate education and skills have not matched up to the growth and expectations of the industry. This paper is an initial study exploring the gaps between the industry's growth and real estate education in Ghana. It adopts a systematic literature review approach with informal discussions with key informants to juxtapose the real estate industry's growth and education gaps. It finds that few universities offer real estate courses at the undergraduate and postgraduate levels. Graduates seeking further studies tend to travel to advanced countries for such opportunities. Although foreign education builds global networks and provides broader perspectives, most graduates do not return to practice in Ghana after their studies. The paper concludes that the limited number of universities offering specialised real estate degree programs in Ghana constitutes a significant determinant of the skills gaps between industry growth and education and worsens the industry's brain drain challenge. Furthermore, the curricula of real estate courses must inculcate the trends in the industry, including blockchain technology, artificial intelligence, and building information modelling. It recommends that real estate education be prioritised for funding opportunities and offered at the top-tier universities to help retain high-performing graduates in Ghana. The universities must also liaise with industry partners to promote productivity, problem-solving and organisational change. To bridge skills gaps, internship-based programs and experiential learning strategies must be restructured to improve hands-on training on property, valuation practice and employability.

Keywords: Real estate education, skills gaps, experiential learning, brain drain, Ghana

THE READINESS OF THE NIGERIAN REAL ESTATE INVESTMENT MARKET FOR THE METAVERSE

Bello, Priscilla Oyebola

Abstract

It is a crystal clear fact that Nigeria is plagued with so many investment challenges and has a long way to go in the application of Information Technology in the real estate sector. Some of these challenges include and are not limited to inadequate land titling and cadastral survey, ineffective real estate financing, insurgency, widespread corruption and a collapsing economy. Nevertheless, there has been an increased investment appetite in the Nigerian Real Estate Market in recent years. Also, it is a well-known fact that technology is an integral part of life that has changed various traditional business models and industries. Hence, the Real estate industry is no exception, as Information Technology is changing the way the industry and the market operate. In this regard, one of the aspects of technology that one cannot overlook is the Metaverse. The concept of the Metaverse is gaining acceptance in the developed world, and every real estate investor should be introduced to what this is all about, why it is gaining popularity, and how it operates. Hence, this paper aims to provide an introduction to property investment and the Metaverse with the objective of evaluating the readiness of the Nigerian Real estate investment market to operate in the Metaverse.

THE EFFECTS OF OPEN-PLAN OFFICES ON SOCIAL, MENTAL AND PHYSICAL WELL-BEING

Thabelo Ramantswana and Lebongang Mmamabolo

Abstract

The nature of work has changed over the century, and office designers have to create environments that support how people work. As a result, office designers came up with different office space layouts ranging from traditional, private offices to open-plan offices. The type of office layout can substantially influence variables such as communication, social interaction and performance. The purpose of this study is to explore ways in which open-plan offices affect employees' physical, social and mental well-being. The research was carried out within the geographical area of Johannesburg Metropolitan Municipality in South Africa. The research focused on five government departments: the Department of Public Works and Infrastructure, Department of Infrastructure; Department of Social Development; South African Police Service Head Office as well as the Department of Human settlements. The purposive sampling technique was used to identify employees who work in open-plan offices and continue to work in open-plan offices amidst the Covid-19 pandemic. The data collection period occurred between May and September 2021. A survey with open-ended questions was distributed to all the selected employees, and 54 responses were received. Thematic content analysis was used to analyse data received from the survey. The study's findings indicate that open-plan office design has contributed to the deterioration of employees' physical, social and mental well-being in the work environment. The move towards an open plan has contributed to employees' inability to work to their maximum. Employees have experienced reduced concentration span, constant distractions from conversations and movement around the office and decreased overall productivity in the work environment. The findings of this study is relevant to Human Resource Managers, Facilities Managers and office space designers. However, further studies are needed to examine the private and public sectors to understand if the dynamics are the same.

INDIGENOUS INFORMAL LAND MARKETS, LAND BANKING AND LAND VALUES: A NATIONAL CASE OF GHANA

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Abstract

Land banking practices can fail in efficiently controlling the value of land. These failures stem from the difficulty in reducing speculative holdings to levels exceeding the size of the banked lands. Such underlining traits of the practice have been drawn from public land banking practices in formal land market settings. Public practices are markedly different to private and quasi-public land banking practices in an indigenous informal land market. Consequently, this paper explores how indigenous informal land markets are influenced by private land banking practices and land values under new land tenure regimes post Ghana's land reforms. Semi-structured interviews with thirty-three participants made up of experts and stakeholders were drawn from four case studies within the Ghanaian indigenous informal land market. We find that land bankers are banking large tracts of indigenous informal lands as capital investments for profits through land dispositions. This is different from the possession of land banks as a production factor for their housing development motives suggested to indigenous heads. The paper recommends a revisit of discussions on the enforcement and monitoring of the processes required under the lands commission guidelines for large-scale land transactions.

Keywords: Ghana, indigenous informal land market, land banking, land values, new customary land tenure

QUEST FOR AFFORDABLE HOUSING IN TANZANIA: CONCEPTUALIZATION OF FEASIBLE TECHNOLOGIES IN THE CONSTRUCTION SECTOR

Sophia Kongela

Abstract

The main long-term challenges for the housing sector in Tanzania have been high costs of finance and a limited supply of decent and affordable housing. Following rapid urbanization and increased demand for affordable housing and housing finance, the government has been intervening in the provision of housing, although there is limited success. Many families especially lower and lower-middle-income live in poor or unfinished houses or rent houses with little possibility of raising funds for building or buying decent homes of their own. The purpose of this study is first, to investigate the extent of affordable housing provision in Tanzania, second, to assess the existing efforts in place of providing affordable housing, and lastly, to assess innovative techniques that would be used to deliver affordable housing that best fit the construction sector. The preliminary findings indicate that apart from institutional investors and a few private developers, the majority of developers do not engage themselves in the provision of affordable housing. One of the reasons is the lack of cheap construction materials. However, it was noted that while some institutional developers have started testing different building technologies that would enable the offering of affordable housing, some few private developers have started using technologies that enabled the offering of affordable housing. On the other hand, institutions of higher learning have started testing different affordable construction materials. However, the efforts in place have yielded insignificant achievements so far. Lack of incentives/subsidies was also mentioned to pose challenges in the provision of affordable housing. This study provides a contribution to the recent discussion on affordable housing, especially in developing countries on the technologies that best fit the construction industry in Tanzania. It is also significant to the policymakers who can influence innovations in the construction industry that will assist in provision of affordable construction materials.

PROSPECTS OF COMPETITIVE POSTGRADUATE REAL ESTATE QUALIFICATIONS IN BOTSWANA: A STAKEHOLDER PERSPECTIVE

Paradaza, Partson, Sungirirai, Loyd, Mosha, Aloysius and Pono, Kemodiretse

Abstract

Ten years after introduction of formal real estate programmes by local universities, Botswana is yet to introduce postgraduate qualifications in real estate. This current situation is compounded by the dearth of research on postgraduate real estate education in Botswana. This paper aims to bridge this gap by seeking the views of key real estate stakeholders on the prospects of introducing competitive real estate qualifications in Botswana. Results and findings will bring value contribution to the to the wealth, social and economic development of the country. The recommendations will add on the human resource development policy in the employment creation point of view. Findings will contribute to institutions of higher education who tend to develop curricula that are similar to other peer institutions to consider the context of their programme curricula. Society is facing numerous new challenges that require professionals to intervene with the objective of developing solutions to improve peoples' lives based on industry requirements.

CHALLENGES, OPPORTUNITIES AND OPTIONS IN SAVINGS AND CREDIT COOPERATIVES SOCIETY SCHEMES AS STRATEGY FOR MICRO-FINANCING HOUSING IN BOTSWANA

Sungirirai, Loyd, Gurajena, Henry and Gaolawole, Grace

Abstract

Botswana's housing finance sector has undergone substantial transformations and growth over the past two decades from a relatively small banking sector dominated by commercial banks to ten commercial banks, four investment banks, two state-owned development finance organisations and one building society. The main aim of this research is to investigate available options for raising housing finance for low income earners in Botswana. The study of this nature is important for the housing finance sector which is mostly represented by the banking sector as the formal system of housing finance, mostly through mortgage finance (Tomlison, 2006). According to (Tomlison, 2006) those that cannot afford a mortgage loan will at least be able to house themselves incrementally through the construction of houses. The study target population constituted the formal registered SACCOS and a sample from Gaborone was drawn for the semi structured questionnaire which was utilised. The quantitative research approach used descriptive statistics to analyse the findings of this study. The research findings supports the notion that non-bank and informal finance systems provide small loans and small savings for housing finance. The informal systems include group-based savings collections such as Savings and Credit Cooperative Society (SACCOS), Internal Savings and Lending Schemes (ISLES) and microfinance firms that cover a wide range of community needs. ISLES serve economic and social purposes.SACCOS are an extension of Rotating Savings and Credit Association (ROSCAS). In Botswana, ISLES exist in various names depending with the community they are commonly popular amongst all and are referred to as motshelo, mahodisano in Setswana,and stokvels - membership is by individual periodic payments which can be weekly or monthly payment with an arrangement of peer lending and is different from microcredit but operate almost in the same way. This arrangement provide a safe financial inclusion especially for those in informal employment.

INNOVATIVE BUILDING MATERIALS IN SUB-SAHARAN AFRICA – COMPETITIVE ADVANTAGE FOR CREATING AFFORDABLE HOUSING?

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Abstract

Housing is one of the most important basic needs for people. However, in Sub-Saharan Africa, the housing shortage is still increasing. The affordable housing sector, in particular, is reliant on alternatives to conventional house building to address the housing shortage. One approach is to implement innovative building materials and technologies (IBMT) for faster construction at lower cost. There are already a large number of IBMT in Africa, which could reduce the housing shortage. However, uptake in African countries is still low and conventional materials are still used to a large extent. Various causes can play a role here. For instance, developers will not exert efforts to implement IBMT without potential buyers. Thus, it is crucial whether the consumer accepts the materials used in construction. Therefore, the aim of this thesis is to identify which IBMT already exist in Africa as well as to understand the desires and requirements that the consumers and stakeholders have towards new materials, and thereby identify on which acceptance criteria their decision depends.

We conducted a qualitative study examining the experiences of experts regarding IBMT in Africa. Based on interviews with highly established multiplier from the field of construction, project development and financing, we contrast findings from existing studies to current insights of the experts. The result of the work shows that obstacles such as developers and banks must be overcome first, i.e. to convince them of the innovative construction method, before acceptance criteria of the population can be met. As soon as this challenge is met, the price of the house plays the most important role for the end user. According to the experts, the quality of the building material as well as social aspects and cultural influences rank very

highly behind the cost aspect. Next important factors are aesthetics and flexibility, and then comfort. Only the sustainability aspect has so far not been important for the population within the affordable housing sector.

For a successful introduction of IBMT, the experts advocate show houses: exclusively theoretical information about technical conditions or advertising via flyers seem less effective. Community concepts including a homeowner association and a community manager are considered a very good option. Solutions to the challenge should account for social structures of the population, and should simulate the local by creating jobs. For the respective IBMT to gain high market acceptance, image creation is essential. This is possible, among other things, by building flagship projects.

Keywords: Affordable housing; construction technology; building materials; innovation.

GREEN BUILDING LITERACY AND HOUSING CHOICE

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Abstract

Green buildings are part of the global strategy to achieve sustainable development. Efforts towards this goal are however hampered by the lack of awareness and high illiteracy about green building. Focusing on the youth, this paper measures the level of green building literacy among Ghanaian tertiary education students, how it differs according to their demographics, and its relationship with their housing choice. Following a comprehensive literature review, we used a structured online questionnaire survey to gather data from 763 Ghanaian tertiary education students. Following statistical tests, the study analysed the dataset principally using mean scoring, Chi-square test and regression techniques. The results suggest that most university students have no or basic knowledge in green buildings. This low level of green building literacy is attributable in part to their demographic features including age, gender, level of education, level of study, employment status, income level of respondents, and whether the person had previously lived in a house with green features. Further analyses show that male student and built environment students have higher knowledge about green buildings and are more likely to have lived in or are currently living in a building with green features, and also more likely to choose a house with green features in the future. Policy-wise, the study shows that educating the youth about green buildings could alter their housing outcomes and preferences in favour of sustainable ones and hence, contribute to achieving Sustainable development goal 11 – Sustainable Cities and Communities.

Keywords: Green Buildings, Green Building Literacy, Housing Choice, Sustainability, Sustainable Development Ghana,

DEMYSTIFYING THE EFFECTIVENESS OF OUTSOURCING CORPORATE REAL ESTATE MANAGEMENT SERVICES IN THE MALAWIAN CORPORATE INSTITUTIONS

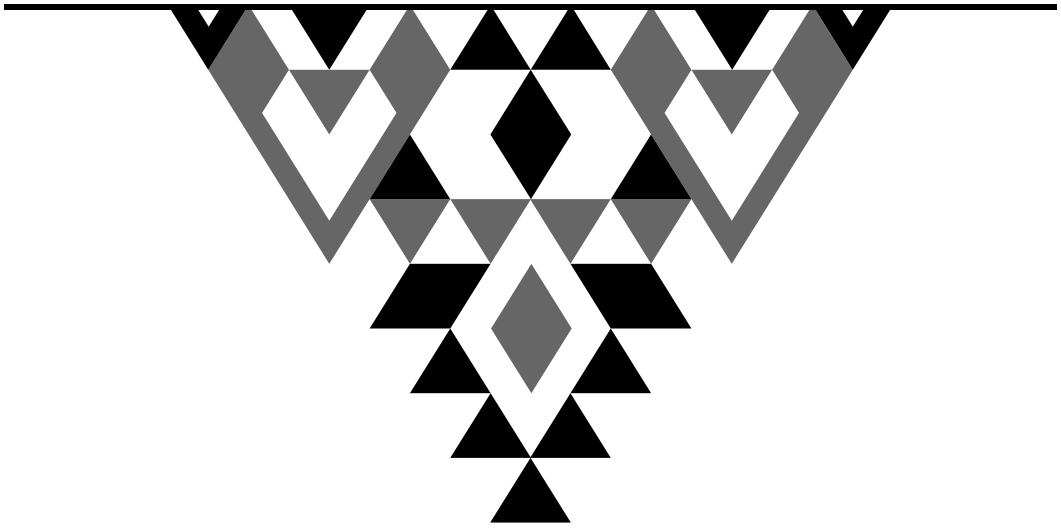
Desmond Namangale and Lumbani Nyirenda

Abstract

Corporate real estate's contribution towards company's wealth and business operations cannot be overemphasized. Therefore, it requires proper management. Two main approaches exist in managing corporate real estate namely: in-house and outsourcing. Most corporations have had their property assets management services contracted out to external service providers. This study sought to assess the effectiveness of outsourcing corporate real estate management services in the Malawian corporate organisation through a case study in Blantyre Central Business District. A quantitative approach was used in which a review of various literature was done and a survey questionnaire was distributed to 20 corporations. The study revealed that corporations prefer outsourcing individual corporate real estate management services rather than the whole real estate department. Amongst the individual CREM services, property management and repairs and maintenance are the most outsourced. The study further revealed that corporations outsource mainly to have access to skills, technology and best practice.

Despite being effective, there is need for further development of the process of outsourcing as it lacks some elements. Therefore, the study recommends benchmarking of performance for individual CREM services that are being outsourced and development of performance measurement tools and enhance communication through the adoption of effective communication tools.

FULL PAPERS



ANALYSING THE IMPLICATIONS OF WORK-FROM-HOME COVID-19 RESTRICTION MEASURE ON RESIDENTIAL PROPERTY MANAGEMENT: EVIDENCE FROM LAGOS RENTAL HOUSING MARKET

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Abstract

Purpose: With a focus on Lagos rental housing market, the study analysed the consequential effects of the work-from-home Covid-19 policy measure on residential property management for policy implications**.**

Design/Methodology/Approach- The study is quantitative and mixed approach sampling techniques were adopted. Stratified sampling was used to categorise ESV firms practising on Lagos Mainland while a simple random sampling technique was employed for sample selection. A total of 97 (74.62%) responses were collected, out of a total of 131 questionnaires administered to the ESV firms in Lagos Mainland which constituted the study population. The data were analysed by simple frequency distribution (SFD), percentage (%) and weighted mean score (WMS) on a 5-point Likert scale measurement.

Finding: During the lockdown period, 84.5% agreed to the use of rental housing for commercial activities, with noticeable activities in residential property types such as a bungalow, block of flat and duplex. Meanwhile, their levels of satisfaction with the use of rental housing for commercial activities varied; only a few (16.5%) expressed total dissatisfaction, with prevalent commercial activities such as offices (4.1546), and mini-mart (3.4330) and shops (3.3918). The majority attested to the adverse effects of the policy, having

short (24.7%), medium (43.3) or long (18.6%) effects on property management. Also, home facilities such as *electricity* (4.1753) and *co-used facilities (*4.1134*)* were highly overstretched, the top-rated property management issues that could emanate (WMS) were *neighbourhood securities* (4.5155*), environmental pollution* (4.0619), *rates and bills* (3.9175) and *maintenance* (3.8144).

Practical implications: The study provides insight into the possible implications of policy geared toward the forceful restriction of citizens at home during a pandemic on property management of the rental housing market.t (3.4330) and shops (3.3918). The majority attested to the adverse effects of the policy, having short (24.7%), medium (43.3) or long (18.6%) effects on property management. Also, home facilities such as electricity (4.1753) and co-used facilities (4.1134) were highly overstretched, the top-rated property management issues that could emanate (WMS) were neighbourhood securities (4.5155), environmental pollution (4.0619), rates and bills (3.9175) and maintenance (3.8144).

Practical implications: The study provides insight into the possible implications of policy geared toward the forceful restriction of citizens at home during a pandemic on property management of the rental housing market.

Practical implications – The analysis indicates that while gender diversity may be insignificant, higher educational qualifications among male and female directors has to be more attractive among REITs for their positive financial results.

Originality/value – This paper contributes to the literature by investigating whether the level of education and gender diversity have an impact on REIT financial performance.
Keywords Education Attainment, Gender diversity, REIT financial performance.

Originality/Value: The study provides information on the sensitivity of the rental housing market to policy implications of the work-from-home Covid-19 lockdown measure for future policy formulation.

Keywords: Covid-19, Restriction, Measures, Rental Housing, Property Management .

1.0. Introduction

The outbreak of the Covid-19 pandemic disrupted the global economy (Copenhagen Economics, 2020) and causes a drastic change in social policy (Ozili, 2020b). The disruption in the global economy and social interactions is attributed to the non-pharmaceutical Covid-19 protocols such as regular wash of hands, wearing of facemask, hand sanitizing, social and physical distancing, and stay-at-home order, introduced by the world health organisation (WHO, 2021). The primary aim of the policy is to curb the spread of the deadly coronal virus. The strict enforcement of the policy measures especially the restriction of people, goods and services (non-essential), and stay-at-home order, the lockdown of the economy harmed the economy (OECD, 2020). Bairoliya & Imrohoroglu (2020) reported that, in the United States, the stay-at-home restriction measure forced the government to close businesses, resulting in about 50% of the population being unproductive.

For the domestic output growth and national revenue, Maliszewska, Mattoo and Mensbrugghe (2020) and Verschuur, Koks and Hall (2021) explained that the global GDP fell by 2.0% below the benchmark and the global maritime sector alone accounts for about 255-412 US$ billion loss of revenue. Barnett-Howell & Mobarak (2020) argued that the effect of lockdown measures is relatively felt higher in developing countries than the developed ones. This assertion aligns with a study by Maryla, Aaditya & Dominique (2020) revealing that the GDP of developing countries significantly declined to about 4% below the global benchmark. According to a report by Economic Commission for Africa (ECA, 2020), African countries are expected to experience many significant effects of the Covid-19 pandemic in revenue decline, job loss and decrease in productivity. In Nigeria, Andam, et al. (2020) discovered that for 8-week of lockdown (March-June, 2020), the country's agro-food sector recorded a decline of 11% and a 9% increase in the nation's poverty level

In the Nigerian real estate sector, a few local studies have investigated the impact of the Covid-19 economic hardship on the Nigerian property market at different capacities (Fateye et al., 2021; Ankeli, et al., 2021; Oyedeji, 2020; Olanrele & Thontteh, 2020). Some authors examine the impact of the Covid-19 lockdown on specific areas of the property market. For instance, Oyedeji (2020) examined real estate market transaction (agency) in Lagos, Ankeli, et al., (2021) focused on Osogbo rental property market while Fateye et al., (2021) used shared office space in Abuja as a case study. Olanrele & Thontteh (2020) and Keke et al. (2020) assessed the effect of the pandemic on the general Nigerian real estate sector. The authors

shared common views on the adverse impact of the Covid-19 pandemic on the property market but to a very degree, attributed it to the uniqueness of property type, market and usage.

Whereas, the effect of the pandemic on the management of residential property, in particular, is yet to be investigated, therefore necessitating the need for the study. In addition, the residential property plays a critical role in accommodating people for dwelling purposes and in many cases used for office/retail activities during the pandemic era. However, the study is set to address some pertinent management issues concerning the level of satisfaction of the property manager on the use of the residential property for office/business activities during the period, attendant effects on the home facilities and possible property management issues. The findings of the study will provide useful information that would enhance property management practice and serve as guidance for similar policy design and enforcement for future pandemic occurrences.

2.0. Literature Review

The effect of the Covid-19 crisis is a global phenomenon, as the impacts were felt across different sectors of the global economy including real estate. The report of the consequential impacts especially those attributed to non-pharmaceutical policy measures and their strict enforcement were noted in real estate industries across the globe. The Covid-19 non-pharmaceutical protocols range from the simple economic challenge of regular hand-washing to complex such as total shutdown/lockdown of the global economic activities, especially at the peak of the deadly coronavirus. This unfavourable situation necessitates the introduction of a work-from-home policy, aimed at striking a balance between life and livelihood. The policy action has a direct/indirect impact on property management, and since the policy action took effect, the consequential implications of Covid-19 on real estate have been a subject of discussion in the public domain.

From the real estate perspective, authors have investigated the implications of the Covid-19 pandemic on real estate industries in different markets across countries. The commonalities of the previous studies are the evidence of both the short/long-term adverse effects of Covid-19 on the real estate market, but there is no uniformity in their findings on the dimension and magnitude of the effects of the global health crisis on the property market across the globe. The difference in the findings could be linked to the uniqueness of local property and levels of

physical, social, economic and political development. For instance, Jovanovic-Milenkovic et al. (2020) examined the impact of the Covid-19 pandemic on the real estate market in China, the USA and Europe. The authors addressed issues on how the Covid-19 pandemic will harm the countries' economies and by extension real estate market development projects. The study discovered that the incidence of the Covid-19 pandemic lead to about 90, 15, and 70% drop in real estate sales in China, the USA and Europe respectively. The authors concluded that although the outbreak of the novel coronavirus was recorded at different periods across the countries, changes in the real estate market behave in the same manner across the globe.

De Toro et al. (2021) analysed the response of the real estate market to the Covid-19 crisis in Naples, Italy. The authors noticed that the lockdown periods made houses become places of living, working and leisure activities. The study, therefore, investigated how residential property responds to new requirements and the trends in the real estate market. The study sampled communities and real estate agents operating in the territory and discovered structural changes in the demand for residential properties in the metropolitan area due to the new requirements as a result of Covid-19. The structural adjustment was attributed to factors such as lower income, household economic instability, changes in lifestyle and working conditions imposed by Covid-19 measures. Hromada (2021) investigates similar studies in the Czech Republic property market. The author's work focuses on sales and rental apartments and examined the implications of Covid-19 on trends in real estate transactions. The author identified some of the emerging challenges attributed to the Covid-19 pandemic to include a deterioration in financial affordability, tenants' mobility from expensive to cheaper accommodation and declines in rent of expensive houses, to be let at lower prices due to affordability problems. The author posited that Covid-19 may cause social injustice by strengthening the accumulation of assets for the richest group.

Similarly, Tanrivermis (2021) examined the effect of Covid-19 on the Turkish real estate sector and possible changes to adopt. The author described the effect of Covid-19 as an unforeseen event in the real estate sector, with the associated policy measures especially the restriction on people and goods, negatively affecting the real estate sector. The author reported the critical challenges faced by the Turkish real estate market during the Codivd-19 difficult times to be a decline in demand, rent collection and property income; dull real estate transactions, property void and an increase in vacancy in hotels, while the operational cost of property maintenance and management experience upsurge. In the same vain, Avakyan and Pratsko (2020) investigated similar studies in Russia's real estate market but from a federal legislative perspective. The authors however posited that the introduction of restrictive measures for

business violates the rights and legitimate interests of business entities, causing renters of real estate for business and accommodation to find themselves in a difficult situation to pay rent. The study concluded that despite all the anti-Covid-19 crisis measures, the country experienced a decline the real income and activities in the real estate market. In India, Bhoj (2020) findings showed that the real estate market experienced a decrease in property inspection and sales.

In the Nigerian real estate market context, a few studies have investigated the implication of the Covid-19 effects on different aspects of the property market, but the property management subset of the market has not been critically examined. This constitutes a major gap in local literature and remains the primary focus of this study. For instance, Ankeli, et al. (2021) work tries to know the trends of activities in the housing rental market in the post-Covid-19 era. The study surveyed the opinions of the practising estate surveyors and valuers in the Osogbo property market and discovered that default and difficulties of property inspections as the prominent challenges characterised by the real estate market in the post-pandemic period. Also, a study by Oyalowo (2020) assessed how media reports on Covid-19 pandemic events have impacted the Nigerian real estate market. . The author employed content analysis using three online nation newspapers namely the Guardian, and the Punch and the Vanguard. The study discovered that while frequent reporting of Covid-19 events was observed during the lockdown period, the prominent short-term implications identified were an increase in the void rate in upper-income residential property submarket, commercial property submarket experienced frequent cases of default in loan, rent and mortgage, and changing pattern of demand for traditional office space.

Similarly, the work by Fateye et al. (2021) focuses on the effect of Covid-19 restriction policy measures on the shared office space submarket in the Abuja property market. The study sampled both the shared office facilities users (customers) and the manager (host) and discovered that the impact of stay-at-home orders was relatively felt higher than other non-pharmaceutical Covid-19 protocols in the study area. The summary of the literature showed a dearth of the study in the real estate property management field. Whereas, property management is critical to achieving the success of an individual or the corporate's investment property goal. Hence a study on the effects of Covid-19 measures concerning work-from-home restriction measures in residential property management will aid the understanding of the implications of the policy to the rental housing market and also help in the formulation of similar policy geared toward combating any pandemic outbreak in the future without much impact on the real estate market.

3.0. Research Method

The study was conducted in the year 2022, using Lagos State as the study area. The study adopted a quantitative survey approach and a closed-end questionnaire was used to collect data from the study population, comprising practising estate surveyor and valuation (ESV) firms in Lagos state. A mixed sampling technique was deployed for sampling selection. First, a stratified sampling technique was used to categorise the ESV firms into two using locations: the Mainland and Island ESV firms. The study, however, used ESV firms that are located in Lagos Mainland because a larger number of the ESV firms are located in the Mainland. Second, the study adopted a simple random sampling technique to draw a sample among the ESV firms that are financial members of the Nigerian Institution of Estate Surveyors and Values up-to-date on Lagos Mainland. A total of 131 ESV firms were identified and administered a questionnaire. The responses collected were analysed by descriptive statistics such as simple frequency distribution (SFD), percentage (%) and weighted mean score (WMS) on a 5-point Likert scale measurement. The weight assigned to the scale range form (ascending order): 1-Strongly Disagreed (SA)/No Effect (NE), 2-Disagreed (D)/Very Low (VL), 3-Unsure (U)/ Low (L), 4-Agreed (A)/ High (H) and 5- Strongly Agreed (SA)/ Very High (VH). Mathematically, WMS is expressed as thus:

$$WMS = \frac{Wn_5 + Wn_4 + Wn_3 + Wn_2 + Wn_1}{N} \quad \text{...eqn 1}$$

Where WMS is the weighted mean score
W – Assigned weight to the scale (1-lowest to 5-Highest)
– Total number of sample

4.0. Result and Discussion

During the field survey exercise, the study with the aid of two (2) research assistants administered a total of 131 questionnaires to the ESV firms practising in Lagos Mainland. The analysis of the response rate is presented in Table 4.1. The result showed that, out of the 131 questionnaires administered, a total of 107 filled questionnaires were retrieved but about 97 questionnaires were properly filed and analysed, given a response rate of 74.05%. The response rate (74.05%) is considered adequate as recommended by Babbie (2007) who stressed that a sample of over 70% response rate is of excellent representation of the entire

Table 4.1: Analysis of Administered Questionnaires

Respondent(s)	No. of Questionnaires Administered	No. of Questionnaires Retrieved	No. of Valid Questionnaires Analysed	Percentage of Response (%)
ESV Firms	131	107	97	**89.13**

In Table 4.2, the study examined the profile of respondents in the ESV firms in the study area. The items examined in the profile of the firm representative were age (in years), highest educational qualification, highest qualification and relevant practising experience in the Lagos property market. The respondents in the age category '26-35' and '46-55' were the dominant age group, accounting for 24.7% each. A larger number (37.1%) are HND certificate holders, 34.0% had attained the 'Associate' cadre in their professional body, while the dominant group with relevant work experience of 16-20 years account for 30.0% of the total study sample. Proportionately, about 87.6% of the respondents are of age 26 years and above, 96.9% had a minimum of HND certificate with 40.2% of them had obtained M.Sc. and Ph.D degree certificates. From the perspective of professional registration and relevant work experience, about 81.4% of the respondents have attained the level of 'Associate' member and above while 27.8% had reached the peak cadre (fellow) on the professional body, with about 70% of them having a minimum of years of working experience of 10 years and above in the Lagos property market. The result of the profile analysis implies that the respondents are well matured, informed, experienced and familiar with activities in the Lagos property market, therefore their opinions, judgments, comments and suggestions on the subject matter of the study are reliable and valid.

Table 4.2: Profile of ESV Firms' Respondents

Profile	Category	Frequency	Percentage (%)
Age (in years)	18-25	12	12.4
	26-35	24	24.7
	36-45	18	18.6
	46-55	24	24.7
	56-65	19	19.6
	Over 65	-	-
	Total	***97***	***100.0***
Highest Educational Qualification	OND	3	3.1
	HND	36	37.1
	B. Sc.	19	19.6
	M.Sc	27	27.8
	Ph.D.	12	12.4
	Total	***97***	***100.0***
Highest Professional Qualification	Prob./Grad	18	18.6
	Associate	33	34.0
	RSV	19	19.6
	Fellow	27	27.8
	Total	***97***	***100.0***
Relevant practising experience	Below 5yrs	12	12.4
	5-10yrs	18	18.6
	11-15yrs	18	18.6
	16-20yrs	19	19.6
	Above 20yrs	30	30.9
	Total	***97***	***100.0***

The study attempted to ascertain the level of familiarity of the respondents with the real estate business activities, especially in the rental housing market during the Covid-19 pandemic era. In addition, the level of agreement, satisfaction and forms of adverse effect characterised by the use of rental housing for business activities during the Covid-19 pandemic were assessed. The result of the analysis is presented in Table 4.3, and the result showed that none of the ESV firms acclaimed not to be aware of the activities in the rental housing market while about 66.0% of them indicate their full awareness. Surprisingly, a higher percentage (84.5%) of the ESF firms expressed their agreement to the use of rental housing for commercial/office activities during the Covid-19 pandemic but only 45.4% of them were satisfied with the incident. Also, the usage of rental housing for commercial/office activities has dynamic adverse effects at various levels on residential property management as

indicated by the respondents, however, medium-term adverse effects were observed to be the predominant effect as indicated by the 43.3% of the ESV firms.

By implication, the high level of familiarity of the ESV firms with rental activities in the rental housing market further ascertained that the respondents are well informed. Meanwhile, a high level of agreement among the ESF firms on the policy was recorded because people were mandated to work from home and strictly enforced by the local authorities. However, the low level of satisfaction by the ESV firms is expected because of the possible damage the restriction measures can cause to residential property and associated property management problems. The adverse effect of the policy has earlier been reported by Fateye et al., (2021), Ankeli, et al. (2021), Oyedeji (2020) and Olanrele & Thontteh (2020). However, the short and medium adverse links to the work-from-home policy measure signal future property management issues the ESV firms could face, such as the beach of contractual agreement, the intensity of usage, security threat or/and overstretching of facilities in the premises.

Table 4.3: Perceptions of ESV Firms on the Work-From-Home Policy on Lagos Rental Housing Market.

Response	Category	Frequency	Percentage (%)
Level of *Familiarity* with the activities in the rental housing market during the Covid 19 lockdown period	Not Familiar	-	-
	Somehow familiar	33	34.0
	Very much familiar	64	66.0
	Total	***97***	***100.0***
Levels of *Agreement* with the use of rental homes for commercial/office activities during the Covid-19 work-from-home period	Strongly Disagree	-	-
	Disagreed	12	12.4
	Unsure	3	3.1
	Agreed	39	40.2
	Strongly Agreed	43	44.3
	Total	**97**	**100.0**
Level of *Satisfaction* on the use of rented homes for commercial/office activities during the Covid-19 work-from-home period	Not satisfied	16	16.5
	Somehow satisfied	37	38.1
	Satisfied	44	45.4
	Total	***97***	***100.0***
Form of *adverse effect* with the use of rental homes for commercial/office activities during the Covid 19 work-from-home period has on the residential property management	No adverse effect	13	13.4
	Short-term adverse effect	24	24.7
	Medium-term adverse effect	42	43.3
	Long-term adverse effect	18	18.6
	Total	***97***	***100.0***

Furthermore, the study probes the predominant commercial/office activities undertaken in the rental houses amidst the Covid-19 restriction period and the analysis is presented in Table 4.4. The commercial activities examined were offices, mini-mart, shops, retail outlets, business centres and vocational centres. To ascertain this, the ESV firms were engaged to express their level of agreement and the responses were analysed by weighted mean score (WMS). The result showed that the ESV firms strongly agreed to the use of office activities having a WMS value of 4.1546 ($4.1 \leq WMS \leq 5.0$). Also, the commercial activities with their corresponding WMS value (in parenthesis) such as mini-mart (3.4330), shops (3.3918), retail outlet (3.3711) and business centre (3.1035) were all agreed upon ($3.1 \leq WMS \leq 4.0$) with by the respondents. Meanwhile, the ESV firms indicated that they were unsure ($2.1 \leq WMS \leq 3.0$) of the case of the use of rental housing for the vocational centre (2.8041). The prominent use of rental housing for activities such as office work is attributed to the need to comply with the work-from-home order that is strictly enforced by the local authorities. Also, other noticeable commercial activities such as mini-mart, shops, retail outlets and business centres could spring up as a result of being a media from which essential goods and services such as food items were been distributed in the neighbourhood. Vocational business activities may not be practicable in rental housing because it requires relatively bigger spaces.

Table 4.4: Prominent Commercial Activities carried out in the Rental Housing Market during Covid-19 Lockdown Period

Commercial Activities	Level of Agreement					TWF	MWS	RMK
	SD	D	U	A	SA			
Office activities	0	6	9	268	120	403	4.1546	SA
Mini Mart	3	24	84	192	30	333	3.4330	
Shops	9	24	54	192	50	329	3.3918	A
Retail Outlet	12	26	27	212	50	327	3.3711	
Business Centre	6	42	108	136	0	292	3.1035	
Vocational Centre	9	48	123	92	0	272	2.8041	U

After the use of rental houses for commercial activities has been established in the previous table (Table 4.4), the study investigated further to know the extent to which the home facilities were adversely affected. The analysis is presented in Table 4.5 and the result showed that discovered that the adverse effect is 'very high' ($4.1 \leq WMS \leq 5.0$) on home facilities such as electricity and co-used facilities, having respective WMS of 4.1753 and 4.1134. The effect on other home facilities (WMS) such as space density (3.8866), racking space (3.8351), security (3.7526), conveniences (3.6289) and water (3.5567) were 'high' ($3.1 \leq WMS \leq 4.0$).

The result implies the depth of damages done to the property and the problems manager should watch out for. For instance, where the situations are not well monitored and managed, there could be a problem of over electricity billing, longer hours of using lightning and security facilities, increase in the number of visitors could put pressure on conveniences, water and threat to the security of the building and neighbourhood.

Table 4.5: Affected Home Facilities during Covid-19 Lockdown Period

Home Facilities	Extent of Effect					TWF	MWS	RMK
	NE	VL	L	H	VH			
Electricity	3	6	0	236	160	405	4.1753	
Co-used facilities	12	24	21	132	210	399	4.1134	VH
Space Density	3	12	9	288	65	377	3.8866	
Packing space	6	6	36	224	100	372	3.8351	
Security	6	6	39	168	145	364	3.7526	H
Conveniences/Restroom	3	12	72	220	45	352	3.6289	
Water	3	12	93	192	45	345	3.5567	

The possible property management issues that could emanate from the adverse effects of the work-from-home policy measure were empirically investigated and the result is presented in Table 4.6. The property management issues attributed to neighbourhood securities (4.5155) and the environmental pollution (4.0619) were rated 'very high' ($4.1 \leq WMS \leq 5.0$). The rating of other identified property management issues was observed to be 'high' ($4.1 \leq WMS \leq 5.0$) but at varying degrees of prominence. In order of prominence, the management issues (WMS) were rated as thus; rates and bills (3.9175), repairs and replacement of damaged home facilities (3.8144), waste management/sanitation (3.7526), rent collection/review (3.2680), tenancy agreement (3.0825) and sublet/sublease (3.0309). However, like other property submarkets where the negative effects of the Covid-19 lockdown policy have been documented such as real estate agency/transactions (Oyedeji, 2020; Oyalowo, 2020) and shared office market (Fateye et al. 2021), the study shows that the adverse effect was not limited to property management.

The result reflects the short and the medium forms of property management issues that could surface as a result of the consequential effect of the Covid-19 work-from-home policy measure. The higher rating of security breached and occurrences of environmental pollution cannot be disconnected from the fact that their negative effects are being felt by immediate property management. The commercial activities bring more people into the locations, and if not properly monitored, it can increase the crime rate in the neighbourhood. Also, crowded

places for commercial activities cause noise, contamination of air and water, and especially where the movement of people is not well coordinated in the neighbourhood. Also, the high-rated challenges of payment of rates and bills for home services such as electricity, water and service charge may lead to a dispute between the tenants and the property manager. For instance overbilling an estimate of electricity due to over-usage, especially in a multi-tenanted property where there is an electricity metric system could lead to a crisis and require the attention of the property manager. However, rent review/collection may not be an immediate management issue because rent and paid in advance, and the review is on a reversionary date in future, but studies have posited that increasing cases of rent default due to the economic hardship attributed to covid-19 lock down measure, which may affect the ability of the tenant to pay rent as at when due. Also, the property management issues concerning the tenancy agreement and subletting/leasing may not be an immediate management issue but have the potential of creating property management problems if not given the required attention.

Table 4.6: Property Management Issues Arising from Work-from home Covid-19 Policy in the Lagos Rental Housing Market

Issues	Level of Effect					TWF	MWS	RK
	NE	VL	L	H	VH			
Neighbourhood Securities	3	12	18	180	225	438	4.5155	
Environmental Pollution	3	24	18	124	225	394	4.0619	VH
Rates and Bills	3	12	9	276	80	380	3.9175	
Maintenance (Repairs and Replacement)	7	0	18	300	45	370	3.8144	
Waste management/ Sanitation	7	6	36	240	75	364	3.7526	H
Rent collection/review	6	24	120	112	55	317	3.2680	
Tenancy Agreement	9	18	132	140	0	299	3.0825	
Sublet/Sublease	10	36	114	84	50	294	3.0309	

5.0. Conclusion and Policy Implications

The impact of Covid-19 work from home policy measure was examined on the management of rental housing in the Lagos property market. The opinions of the ESV firms practising in Lagos Mainland were sought and analysed. For key findings were revealed by the study. First, the property manager admitted to the use of rental housing for commercial activities during the Covid-19 lockdown but they were not satisfied with the situation. The reason could be

attributed to lingering incidences of the Covid-19 crisis which has kept people and businesses locked down. However, in other to survive along with the occurrence of the coronavirus, business sectors but private and the public have to devise new means to ensure continuity of economic activities amidst waves of the infection to strike balance between life and livelihood. Secondly, adverse effects of the policy measure on property management were ascertained; with the effects having short and medium dynamics on property management. The result aligns with global trends in all sectors of the economies in which real estate is the worst hit (Jovanovic-Milenkovic et al., 2020; De Toro et al., 2021; Ankeli, et al., 2021). Third, the use of rental apartments for offices, mini-mart and shops was prevalent, leading to the overstretching of home facilities especially the electricity, and co-used facilities among others. Lastly, the prominent property management issues on rental housing that could emanate as a result of the consequential effects of the Covid-19 work-from-home policy measure include issues concerning the security of the building premises and neighbourhood, environmental pollution related problems such as noise, quality of air, issues on rates and bills payment for service users such as electricity, water and service charge, and maintenance problems such as repair and replacement of damaged facilities in the building premises. Whereas some of the property management issues could be a short-term effect, others may constitute a long-term management problem. The study however showed that like another sub-market of the real estate market such as agency, property development/investment, and mortgage, the property management practices are not spear by the negative effects of the Covid-19 crisis. Conclusively, the study established that the policy on forceful restriction of people such as work-from-home measure has time dynamic effects on property management, especially for the rental housing market which constitute the largest market in the real estate investment sector due to the critical role housing plays in nation building. However, to protect the rental housing market and its management practice, it is pertinent to critically consider the peculiarities of the property market in the future formulation and implementation of policy measures, especially during the pandemic period.

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DO INTERNALLY MANAGED REITS MANAGE EARNINGS MORE THAN EXTERNALLY MANAGED REITS?

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Abstract

Purpose – The purpose of the paper was to provide an empirical examination of earnings management among internally and externally managed REITs. The empirical accounting literature claims that internal management of a firm does not constrain earnings management, while others argue in favour of internal management for firms.

Design/methodology/approach – Using a sample of listed South African REITs for the 2013 - 2021 time period, we examine the relationship between management structures and earnings management.

Findings – We do not find any aggressive practice in internally managed REITs during the study period.

Practical implications – The study's findings imply that good corporate governance is a critical safeguard for stakeholders in exceptional circumstances when REITs have special incentives to manage earnings; as a result, it is suggested that REITs' corporate governance is important, despite being overlooked in some circumstances. Specific to South African REITs, policymakers as well as nominating committees of the board of directors may wish to take note that financial competence is an important quality of external directors in order to effectively curb earnings management.

Originality/value – This is the first study to investigate financial sheet manipulation among REITs management structures in an emerging market.

Keywords. Earnings Management, Discretionary Accruals, REITs, Emerging Markets

1.0. Introduction

The perceived manipulation of financial sheets within the real estate investment trusts sector has become a topical issue. Zhu, Ong and Yeo (2010) opined that it appears Real Estate Investment Trust (REITs) managers engage in activities such as earnings management; the paper equally argued that this tends to be a possibility because of the heavy reliance on finance from external sources in funding their investment and expansions. In similar vein, Adams, Hayunga and Rasmussen (2017) recently corroborated this by stating that there appears to be a possibility of REITs engaging in financial sheet manipulations owing to the fact that such firms needed to file their financial statements with their respective securities regulatory bodies. Although the real estate industry has seen a lot of progress in securitized real estate, REITs do not have sufficient data to provide both corporate and individual investors with a clear understanding of their investment risk (REITs) (Zhu, Ong & Yeo, 2010). These market microstructure distinctions include dividend pay-out obligation and restriction on property investment. REITs cannot support investment activities by internally generated profits, hence this is unwanted for them (Deng & Ong, 2018). Indeed, the REIT sector has been perceived as more transparent than other businesses because of its rigorous regulatory requirements, physical assets, and highly predictable income flow (Schrand, et al, 2021; Olanrele, et al, 2015; Newell and Osmadi, 2009; Morri and Beretta, 2008; Joseph, et al, 2006). Existing literature (Zhu et al, 2010; Deng and Ong, 2014; Seguin, 2016) noted that while the perceived transparency within the REITs sector ought to ameliorate potential engagement in earnings management; yet, there are also wide reports of investor concerns with respect to low dividend yields; these aforementioned studies equally reported that managers tend to attempt to manipulate the financial sheets in favour of external sources of financing. Chiang (2015) had reported that dividend yields of REITs in emerging (especially African) markets appear not to have performed comparatively with their counterparts in developed markets.

Earnings management are economic acts used by managers to conceal the actual financial performance of their company. Various strategies, such as delaying revenue recognition, boosting or reducing discretionary spending, and disposing of assets, are able to influence the earnings of REITs. The study predicts that in times of increased SEO activities of REITs, they will engage in microstructure-induced earnings management practices to reduce the cost of capital. The study therefore asks the research question: Do Internally Managed REITs Manage Earnings more than Externally Managed REITs around Secondary Equity Offerings? - This is the question the study wants to address in this article. If earnings management techniques in the

REITs sector are significantly curtailed, or perhaps eliminated, policymakers will do well to encourage businesses to seek debt funds; by implication, buyers will gain in two distinct ways: their dividend yields will increase and management will be less likely to deceive them. REITs who manipulate financial results in a bid to create cash flow, those with frequent share price announcement (SEOs), and those with an inactive corporate governance structure, high leverage are all pointers to perceived engagement in earnings management (Cohen and Zarowin, 2010; Ghosh, and Sirmans, 2006). Further, most issuers would have run out of cash by the year after the SEO had they not received the offer revenues (DeAngelo et al, 2010). Ling and Wu (2013) observe that firms' cost of equity is lower prior to SEO filing when there is an increase in liquidity risk. Like with all REITs, there is a larger amount of liquidity risk for REITs than common stocks, and so REITs' desire to manage their liquidity risk is stronger (Deng and Ong, 2018). Moreover, earlier studies found that firms will sell expensive shares by means of earnings manipulation (the behavioral hypothesis). As SEO firms have been discovered to engage in genuine earnings management in post-SEO firm performance (Kothari, et al, 2016; Deng and Ong, 2014; Yang, et al, 2013); this means that in the aftermath of SEOs, the long-term trend of poor post-SEO firm performance will be more profound than post-SEO firm manipulation (Cohen and Zarowin 2010; Rangan 1998).

Earnings management efforts over accrual-based manipulation are favored among REIT managers because of a major reason; a reason being that REIT managers are also limited by the dual performance measurement by net income and money from operations prior to enhancing their compensation by actions like merger and acquisition (Zainudin, et al, 2019; Deng and Ong, 2018). Because REITs with low operating cash flow are less likely to seek external funding, their motivation to control net operating income is greater than for other companies. In terms of REIT exposure to SEO timing, the study has just begun to focus on SEO timings in connection to the degree of earnings management. In light of South Africa's recent financial scandals (Holtzblatt, et al, 2020; Jooste, 2011), this study contributes to investigating possible instances of earnings manipulation among REITs on the Johannesburg Stock Exchange. These incidents call into doubt the competency and ethics of firm managers which, in turn, drives investors and future investors to question the financial statements that they receive. For instance, the South African Institute of Chartered Accountants started an inquiry on November 2, 2017 to investigate the conduct of a handful of troubled accountants and managers. REITs being examined in this paper is intended to expand the understanding of the prevalence and degree of earnings management activities in South African REITs. Of interest is the specific relationship between management structures of REITs and instances of earnings management in the South African market. When ownership and management are separated,

the study may expect alternative decisions including differing degrees of earnings management to emerge (Ambrose & Linneman, 2001). Based on the pioneering evidence of Jensen & Meckling (1976), the study assumes that REITs like other firms are vulnerable to earnings management. Several scholars have examined the influence of REIT ownership/management structures on REIT performance to the exclusion of earnings management.

According to An, et al. (2016), REITs have two basic types of management structures: internal and external; managers who work for a REIT but are governed by the REIT's authorities have control over the structure. REITs use people in a variety of roles, including asset management, acquisition, and advising. The paper also noted that REITs with external management have a more marked control and ownership split. An intermediary asset management firm engaged by the REIT manages the day-to-day property management, financial and operational duties. As a result, the REIT firm pays a variety of fees to the managers; it is possible to charge a flat fee or an incentive fee, both of which are based on a percentage of the fund's assets under management (AUM). Ooi (2009) for instance documented that compensation paid to externally managed REITs managers must be scrutinized due to the underwhelming performance of these firms in the United States and the looming global financial crisis. REITs have historically behaved like mutual funds in the United States (US), with the exception of the ability to trade. REITs were required to engage advisers who served as managers, selecting properties and implementing investment plans inherent with tendencies to manage earnings on behalf of the REIT. In contrast to other passive investments such as bonds and shares, property investments necessitate the employment of property managers, which is why numerous REITs noticed inefficiencies and a conflict of interest among advisors/REIT managers and shareholders in the late 1980s (Wei et al. 1995; Ambrose & Linneman, 2001). REITs were permitted to engage in self-advisory and management activities following a modification in the legislation in 1986. REITs grew rapidly in the 1990s, and this sparked several academic studies on the organizational management structure of REITs and its effect on REIT performance. In spite of the argument for REITs being internally rather than externally managed, several REIT regimes have embraced externally managed structures since the US first implemented it. Most REITs, particularly in Asia, have an externally managed structure, either by default or as a necessity, indicating that externally managed REITs have certain advantages. Due to the increasing use of REITs as a form of indirect property market investment; and REITs' increasing appetite for expansion (mergers and acquisition) including other reasons, it is critical to examine how their management styles/structure and corporate governance influences the degree of earnings management around SEOs.

[1]fraudulent financial reporting; Corporate malfeasance; Audit Scandals

It is possible to assume that the individuals assigned with preparing financial statements are conflicted (Ronen & Yaari, 2008; Burgstahler, et al, 2006) which increases the likelihood that the financial statements are incomplete and inaccurate. The statistical models presented in this paper use data obtained from the Stock Exchange News Service (SENS) and IRESS Expert database to first examine if there are financial sheet manipulations around SEOs; and subsequently, the degree of earnings management (if any) around the different management structures of real estate investment trusts (REITs) listed on the Johannesburg Stock Exchange. The study contributes to the REIT literature in two ways. First, it provides novel evidence on earnings management behavior of the different management structures around SEOs in the REITs sector. Second, it extends this line of inquiry into the REIT market in a developing country. Also, because the legislative requirement of a 90% dividend payout is often considered to lessen agency problems and hence minimize earnings management activities in REITs, the study of earnings management in REITs is extremely significant; according to Boshoff and Bredell (2013), the new tax treatment allows a SA REIT to deduct all distributions made to shareholders as a cost. As a result, if all distributable earnings are distributed to shareholders, they will not be taxed. SA REIT is exempt from Capital Gains Tax (CGT) on property transactions. When purchasing or selling REIT shares, SA REIT shareholders are not required to pay any Security Transfer Tax (STC). Investors will receive gross payments that are not subject to the 15% dividend tax. Their dividends, however, will be included in their taxable income. By implication, this allows investors to use debt efficiently to fund the acquisition of their REIT investment on a pre-tax basis. If the investment in a SA REIT is part of a pension, provident, or preservation fund, no tax is payable; nevertheless, foreign shareholders of a SA REIT must pay 15% of their dividends or the double tax agreement may apply; in all, REITs listing requirements limits the debt to gross asset value for SA REITs. Also, the insights will assist investors in gaining from management being less able to deceive them in addition to greater dividend rates. The results should be of interest to both investors and governments who hope for real estate capital markets to work as efficiently as possible. The remainder of the paper is framed as follows. The following section conducts a review of pertinent literature. The next section presents the testable hypotheses and data sources; this is inherent with "Measuring Financial Results Manipulation" which describes ways to quantify prevalence and degree of financial manipulation. The subsequent section "Empirical Results" summarizes and interprets the empirical findings from univariate and multivariate regression analyses. The last section is referred to as the "Conclusion."

[1]fraudulent financial reporting; Corporate malfeasance; Audit Scandals

2.0. Literature Review

2.1. Earnings Management

Financial reporting enables managers to keep stakeholders informed about their firm's performance. Financial reporting, in an ideal world, would assist the best-performing enterprises in the economy in differentiating themselves from the poor performers and would promote resource allocation and stewardship by stakeholders (Healy and Wahlen 1999). Managers may leverage their company experience to enhance the usefulness of financial statements as a communication tool with potential investors and creditors. When management is needed to select between alternative accounting procedures for reporting the same transactions, judgment is required. Additionally, management must apply judgment when establishing provisions for future liabilities like as research and development expenses, bad loan losses, or asset impairments. Additionally, managers might employ smooth earnings trends to indicate to investors their firm's higher profits potential (Tan & Jamal, 2005; Graham et al., 2005). Similarly, Tucker & Zarrowin (2006) demonstrate experimentally that managers' use of financial reporting discretion has the impact of disclosing additional information about businesses' future earnings and cash flows. As Scott (1997) previously said, managers may leverage their financial reporting options to provide extra information to consumers about the firm's future expectations. Despite this good aspect of managers' judgment, it also provides managers with a chance to influence financial statement users in ways that benefit them the best. Earnings management is the deliberate falsification of earnings that results in the bottom line figures being different than they would have been in the absence of any manipulation (Mohamram, 2003).

According to these definitions, earnings management is a deliberate intervention by an organization's management in the financial reporting process with the intent of influencing financial report users in order to obtain an advantage for themselves or the firm. By implication, this is the practice of accounting judgment, commonly known as accruals management. In the case of REITs specific accruals, they are bound by a minimum dividend payment policy (at least 90% of taxable income); as a result, REITs pay out a substantially higher percentage of their earnings than conventional corporations (Ambrose & Bian, 2010). This might mean that REITs are more likely to have insufficient financial slack, which can be useful when external funding is expensive (Ferguson & Stevenson, 2014). Equity financing, for example, may be expensive due to the asymmetric knowledge problem identified by Myers

and Majluf (1984). Furthermore, debt financing may be unfavorable owing to risk-shifting or debt overhang issues. Thus, in order to avoid being deprived of financial slack, REITs may benefit from managing their earnings lower; this required payout policy, on the other hand, forces REITs to return to the capital market on a regular basis to raise external cash. This procedure gives foreign investors more opportunity to gather information (Ambrose & Bian, 2010). Existing equity investors, according to Easterbrook (1984), face the challenge of collective action and frequently impose insufficient scrutiny on management. Thus, raising fresh capital on a regular basis exposes managers' performance to regular examination from new investors, who are not subject to the collective action problem. This ongoing review should encourage managers to eliminate organizational inefficiencies in order to get the best price for their new equipment. As a result, more important and impactful information should be imbedded in stock trading, improving REIT organizational efficiency.

When management's participation in the financial reporting process has an effect on total accruals in a way that is not consistent with regular economic activity and conditions, abnormal accruals occur. Hoogendoorn (2011) distinguishes two types of accrual management: The first category encompasses the application of earnings management via accounting policies or procedures. This refers to the selections made about depreciation methodologies and inventory valuation, among other things. Managers might exercise discretion by selecting or adjusting accounting methods to benefit themselves or their organization. The second group includes the estimations that managers must make throughout the financial reporting process. This comprises time and cost estimates made in a variety of methods throughout the reporting process. Later on, it will become apparent that the introduction of fair value provides a significant potential for earnings management via estimations. Managers have discretion over the techniques and estimations used to calculate discretionary accruals, as well as the timing of their recognition (Xiong, 2006). Financial fraud is the purposeful distortion or omission of material facts of accounting data that is misleading and, when combined with all available information, causes the reader to change or adjust his or her judgment or choice (National Association of Certified Fraud Examiners, 1993; Dechow and Skinner, 2000).

2.2. REITs Seasoned Equity Offering

The literature on REITs deals extensively with seasoned equity offers. The market reaction to security issue announcement is well documented. Similar to regular stock trading, in the pecking order theory analysis, a strong negative reaction is discovered. Using data from 1970

to 1985, Howe and Shilling (1988) found that, for every 1 percent increase in equity issues, there was a 0.6 percent decrease in the stock price, whereas for every 1 percent increase in debt offerings, there was a 1.3 percent increase in the stock price. REITs stock issuance had a considerable negative market reaction in the 1990s according to a paper published in 2000 by Ghosh et al. (2000). Equity offers alongside another thread of literature focused on capital structure transformation are found in REIT literature. Researchers in the field of REITs have mostly been focused on analyzing the signaling impacts of equity and debt offerings of REITs since these properties minimize the impact of trade-off and pecking order rationales (Howe and Shilling 1988; Brown and Riddiough, 2003). A recent body of empirical research has found that REITs adopt target debt ratios in general in the securities market. A group of researchers (Ooi et al, 2010) examines the timing of REIT IPOs and debt-to-equity ratios. They argue that REITs timing the market using debt-to-asset requirements that are more generic in nature. Studies by Boudry et al. (2010) and Ghosh et al. (2011) found that the market timing theory offers considerable support for the market-timing decisions of REITs, as well.

There is a lack of study on REIT SEO price, according to studies. According to Ghosh et al. (2000), ownership concentration, offering size, as well as underwriter reputation all have a significant role in REIT SEO underpricing (Ghosh et al. 2000). Investors may demand further discounting if the investment has an abnormally high placement cost and value uncertainty, according to other researchers. There is considerable evidence of behavioral trading in the real estate market when REIT short-selling and IPO returns are included (Blau et al. 2011). There is a surprising lack of research on the impact of work-based income on the seasoned equity issuance and pricing procedures of real estate investment trusts. Some uncertainties persist despite the fact that experienced equity offerings have had a substantial influence. Recent research demonstrates that many securities issuers engage in substantial actual investment activity surrounding stock offerings, demonstrating that the assets of the company have a significant impact in determining the amount of investment capital required. Knowing how the manipulation of real earnings impacts decision-making surrounding the issuance of seasoned equity securities or how this may effect expected stock returns would be intriguing.

2.3. Performance of REITs Management Structures

Real estate investment trusts (REITs) can be classified as either internally or externally managed. When REITs were first proposed, they were intended to be passive investment vehicles similar to mutual funds, except that they would have trading limits (Ambrose &

Linneman, 2001). The paper noted that REITs were required to engage 'managers who would sit on boards,' who performed tasks comparable to those of mutual fund portfolio managers; apart from this, REITs investment managers were also responsible for the selection of assets and the implementation of investing plans. Real estate investments, unlike stock or bond portfolios, necessitate active management to lease, operate, and finance the properties (Baum & Hartzell, 2012). In same vein, REITs also employed 'managers' who were responsible for the day-to-day management of the property. A number of REITs in the late 1980s identified the inherent conflicts of interest between these advisors/managers and REIT shareholders as a result of fee structures that were not linked to REIT performance (Chan et al., 2003). According to Hardin III, et al. (2009), evidence on the performance of REITs is affected by their external versus internal management structures. The paper noted that both internal and external management structures were demonstrably superior across each time period at a much reduced risk. For instance, it was established that the external manager A-REIT series outperformed the stock market in each time period, particularly during the global financial crisis. Also, three A-REITs that were part of the external management series had minimal gearing and no international property in their portfolios; therefore, there was some overlap between these variables and their proven performance. Ambrose & Linneman (2001) continued to note that growth in the real estate market was hampered by the tensions between advisors/managers and REIT shareholders. Traditional developers/operators risk alienating control of their properties when they converted to REIT status without the ability to actively manage their assets. In 1986, the Internal Revenue Service issued private letter judgments permitting REITs to assume responsibility for selecting investment properties and managing their assets, allowing them to become 'self-advised' and 'self-managed'. After Kimco REIT's IPO in 1991, the need of addressing these conflicts became widely understood. There were two competing organizational structures in REITs during this period of fast growth, which is an interesting subject to look at.

2.4. Earnings Management and SEOs

According to research on businesses that issue SEOs, reported earnings of such businesses are exceptionally high during the SEO period, which is due to abnormally large accruals. If management opt to issue shares far in advance of the offering announcement, they will manage profits in advance in order to affect investor expectations about the business. Dechow et al. (1996) argue that one of the primary motivations for manipulating results is to get low-cost external funding. With fabricated financial statistics, issuers might obtain an edge in negotiations with underwriters on the terms under which securities are offered.

Simultaneously, a higher price helps the company since it allows the issuer to earn a greater profit from the offers. There will be less dilution of ownership as a result of the additional shares for the same amount of money collected. Despite the potential benefits of overstating earnings, earnings management may incur expenses. According to Dechow et al. (1996), businesses recognized by the Securities and Exchange Commission as earnings manipulators suffer a higher cost of capital. Additionally, qualifying audit findings or litigation may have a detrimental effect on the firm's image and reputation. As a result, it is reasonable to expect managers to make every effort to control financial performance. It's logical to anticipate that profits manipulation will continue for several quarters, as this will make the manipulation more seamless and difficult to detect. As a result, the quarters immediately before an offering announcement are the most sensitive to earnings management (Rangan, 1998). To preserve their tax-exempt status, REITs must distribute a significant portion of their taxable revenue and hence rely significantly on external funding to support their investments and growth. As a result, REITs must access the financial markets and raise cash more often than other types of securities. REITs undergo increased scrutiny from different capital market players because of their frequency of SEO issuance. This feature is likely to have an effect on the way REIT managers manage their earnings. Dechow et al. (1996) argue that managers of companies that need regular external funding would declare profits cautiously in order to establish a favorable market reputation that would benefit future offers. As frequently used, two or more public offerings over the course of two years qualify as 'frequent issuers.' when offers are made, managers may have previously predicted the next offering in pipeline. This expectation is believed to alter managers' incentives to manipulate profits and the degree to which earnings manipulation occurs (Shivakumar 2000). Although it is foreseeable that another offering will follow shortly after the present one, there will be a cushion built into profits management, since excessive financial manipulation may tarnish the firm's image and, as a consequence, result in increased financing costs for future offers. As mentioned previously, the REIT business is characterized by regular SEOs.

The existing literature has mostly focused on whether firms manipulate earnings around the issuance window, as well as the accounting and stock market repercussions of these actions (Rangan, 1998 & Teoh et al., 1998). Because of the empirical evidence that SEOs are accompanied with negative stock returns and bad profits performance, this research is leaning towards the conclusion that high earnings management in anticipation of SEOs occurs on occasion, which is then overturned (Teoh et al., 1998; Rangan, 1998; Shivakumar, 2000). SEO corporations have a tendency to have positive anomalous accruals (i.e., upwardly

manipulated reported profits) during the year preceding the SEO, which indicates both earnings reversals and poor stock performance in the following year. The findings of the article show that enterprises manipulate earnings upward around SEOs, and that the stock market is misled by the upwardly managed earnings, temporarily overvaluing issuing companies and then being disappointed by the forecasted earnings declines of such companies. Additionally, Teoh et al. (1998) found that SEO issuers that move profits upwards more (i.e., have larger positive anomalous accruals) had lower post-event stock returns as well as weaker earnings following the event. For the first time, DuCharme et al (2004) offer a legal viewpoint on the study of SEOs. Settlement amounts are directly linked to irregular accruals for SEOs who subsequently get sued. Furthermore, post-SEO reversals are more dramatic for SEOs who have been sued, and their post-SEO stock returns are lower. Post-SEO litigation, they say, is driven by earnings manipulation. Accrual earnings management is frequent in SEOs and is associated to post-event litigation, according to these studies. Whether or not the stock market is misled, on the other hand, is the subject of much controversy.

Indeed, it appears the EM practice attempts to explain the concerns surrounding stock pricing during the event window and period (SEOs); much more importantly, concerns on what motivates managers of firms in engaging in EM practice is fast becoming topical. Yoon and Miller (2002) investigated 249 Korean SEOs by firms between 1995 and 1997; this was done to estimate the level of manipulation by firm managers on earnings/returns prior to the event period. At this point, the evidence revealed that the Korean firms which contemplated SEOs as a means of raising funds managed their earnings a year prior the event window; it is assumed that the firms' financial performance had been poor. The impact of earnings management (EM) appears to have become the mainstay since the advent of bankruptcies in the financial and stock sector. It is assumed that regulators and stakeholders (industry practitioners specifically) deliberately manipulate financial reports (accruals/earnings/returns) in a bid to “make the books look good” to potential investors. Bortoluzzo, Sheng and Gomes (2016) had recently examined the impact of EM; findings revealed that firm managers appeared to have influenced the amount of earnings in the financial reports by imputing the loan loss provisions. Information veracity of financial reports is increasingly becoming of utmost concern as stakeholders tend to engage in returns/income smoothing in order to convey a consistent image of good performance to the potential investors. As such, the EM phenomenon merits attention in a sector that appears to be gaining keen interest; the real estate investment sector.

3.0. Theoretical Underpinnings and Earnings Management

Evidence suggests that a company's size, leverage, and return on asset (ROA) all have a role in how it manipulates earnings (Iturriaga and Hoffmann, 2005; Hessayri and Saihi, 2015; Heninger, 2001; Daniel et al., 2008; Siregar and Utama, 2008; Sun and Rath, 2009; Jelinek, 2007; Chung et al., 2005). This shows that both accrual-based and real activity-based approaches of managing earnings are indeed dictated by these influencing variables. Based on their Positive Theory, Watts and Zimmerman (1986) presented three main assumptions. Firms internal contractual motivations for earnings management is addressed in the theory. Incentives for earnings management are based on set contracts that utilize accounting figures, according to the assumptions. According to the bonus plan theory, the purpose of accounting decisions in management pay plans is to provide performance bonuses (Xiong, 2006). To balance the interests of management and shareholders, managers are compensated in addition to their normal pay according to their performance. When companies evaluate managers' performance, they typically look at specific accounting data. Incentives for managers are therefore there so that they may identify the right accounting techniques and apply judgment over accounting estimations to help them get raises (Xiong, 2006). Debt covenant hypothesis claims that debt covenants lead to earnings management. In order to make sure they can fulfill their debt obligations, creditors put limits on the payment of dividends, share repurchases, and new debt issuance for a firm's creditors (Xiong, 2006). Management is incentivized to ensure that every criterion is satisfied by manipulating accounting figures. In the most recent studies on earnings management, researchers have taken a back seat to capital market motivations as an explanation of managerial opportunism (Xiong 2006). For example, Burghstahler and Dichev (1997) disregarded explicit contract earnings management approaches. It was argued that contracts such as this are not frequent enough to explain the widespread avoidance of losses and earnings reductions.

3.1. Earnings Management and Firm Characteristics

3.1.1. Firm Size and Earnings Management

The effect of firm size on earnings management is likely to be negative. This is because larger REIT firms are more likely to have strong internal controls and better auditors who can effectively mitigate earnings management. Firms with a higher revenue can also be audited by large audit firms with auditors who have a more extensive track record. This means the

potential for earnings management is much reduced. Major REITs may also be more concerned about their public image, which could discourage them from attempting to manipulate the company's results (Kim et al., 2003; Lemma et al., 2013). Lemma et al. (2013) documented evidence on this noting that the risk of reputation damage from leaked financial information is greater for large firms, which is why they believe auditing firms would provide more valuable services. In addition, large firms are under increased scrutiny from analysts, investors, and regulators, which gives them an incentive to avoid earning management (Sun and Rath, 2009). Also, Kuo et al. (2014) contend that large firms face more intense examination by auditors and authorities, due to the size and nature of their operations.

Conversely, there is also evidence that firms with more 'Wall Street' scrutiny may face a greater incentive to manipulate earnings forecasts (Lemma et al., 2013). More importantly, the major firms in this sector have higher bargaining power with auditors, which makes it more likely that auditors will give an audit report that declares earnings management attempts have been successful for large customers (Nelson et al., 2002). Large firms have a greater current asset base, allowing them to use earnings management more effectively (Kim et al., 2003). Results are inconsistent with respect to the nature of the association. Firm size and discretionary accruals are confusing in regards to one another according to Koh (2003). His further argument is that whereas huge corporations are subject to different regulatory and analyst scrutiny, this can diminish prospects for profit manipulation. When it comes to earnings management, those authors that focus on size find that there is a positive link (Moses, 1987; Rangan, 1998; Michaelson et al., 1995; Lemma et al., 2013), while authors who consider several other factors conclude that there is a negative relationship (Heninger, 2001; Sirat, 2012). Michaelson et al. (1995) found that large firms engaged in earnings management to appear less risky to investors, whereas smaller firms did not. To determine whether or whether accruals-based earnings management activities are present in the firms studied by Burgstahler and Dichev (1997), the paper investigated if these activities were present in US firms. Following losses or drops in earnings, larger and smaller firms boost earnings. In the paper earlier mentioned, they make the assumption that managers hide revenue and losses to minimize the financial impact on the company. According to Rangan (1998), U.S. firms have a significant relationship between accounting practices that value future revenues and the success of seasoned equity offerings. Additionally, the paper demonstrates that older and larger firms change current accruals in order to create the impression of greater earnings and higher profitability.

3.1.2. Debt/Equity Ratio (Leverage)

Higher leveraged firms may tend to manage earnings in order to prevent bond defaults (Lemma et al., 2013; Sun and Rath, 2009; Becker et al., 1998; Mohrman, 1996; DeAngelo et al., 1994; and Defond and Jimbalvo, 1991). A possible motivation for firms to engage in earnings management may exist since breaching debt covenants carries a penalty. Leverage has the opposite effect; Debt-dependent firms generally have constraints on how much they may spend (Jelinek, 2007). The paper contends that managers that attempt to restrict free cash flow use would pursue projects that provide value for shareholders while spending all of the discretionary funds on approved projects. Additionally, more stringent leverage requirements could minimize earnings management practices (Zamri et al., 2013; Jelinek, 2007; and Iturriaga and Hoffmann, 2005). DeAngelo et al. (1994) found that American firms that employ debt financing and debt covenants display management decisions meant to provide a more favorable view of the firm to creditors in order for creditors to be able to decrease their loan obligations. While Mohrman (1996) argues that accounting procedures that increase current income are likely to be adopted by firms with higher leverage in order to avoid debt covenant violations, this view is also supported by John, who posits that increased current income and accrual-based accounting will be favored by firms with higher leverage in order to dodge debt covenant violations.

With all of the above, it is clear that firms enter into debt covenants (borrowing money) (Doron and Penman, 2003). Debts serve the purpose of restricting management from making decisions that diminish the value of the creditor's claim. Only in this specific case, debt covenants could restrict the payment of dividends when a company's revenue falls short of particular income standards (Nelson and George, 2013). Additionally, violations of debt covenants result in extra expenditures for the organization (Nelson et al., 2013). The fact that firms near a debt covenant violation have accounting choices that are likely to make a default less likely has been noted by Watts and Zimmerman (1986). Sweeney (1994) looks at the claim that debtors who fail to pay back their loans update their accounting methods in the years before bankruptcy (more frequently than comparable firms that do not default). Sweeney (1994) shows that managers, when facing increased debt covenants, adjust accounting processes. The study also claims that companies that are running afoul of the rules imposed by GAAP (generally accepted accounting principles) are more prone to make discretionary changes to increase income. Finns also apply accounting modifications to increase income earlier than control corporations. In the case of South Africa, the International Financial Reporting Standards (IFRS) and in accordance with numerous studies, the introduction of IFRS would likely diminish earnings management and managerial discretion. The implementation

of the new IFRS, which allows for the option of fair value accounting for real estate investment assets, has radically transformed the landscape of financial reporting for real estate corporations globally. Based on findings (Quagli & Avallone, 2010; Edelstein, et al., 2012). The study discovered that under the IFRS, firms prioritize market asset values above alternative criteria for present performance. According to previous research, the majority of real estate firms prefer to record fair values for investment properties in their financial statements rather than in the notes to the financial statements. The findings of Chebaane & Othman (2013) demonstrate the influence of implementing IFRS fair value accounting on the reporting of investment property information. Following the adoption of the IFRS, companies have two options for accounting for investment properties: (1) on the balance sheet at fair values and on the income statement with unrealized gains and losses (i.e., the fair value model), or (2) on the balance sheet at cost with notes used to disclose fair values on the financial statements (i.e., the cost model).

Although fair values must be recorded somewhere in the financial statements, managers of REITs have the option of not reporting fair values on the balance sheet and the related unrealized fair value profits and losses on the income statement (Aboody, et al., 1999; Dietrich, et al., 2001). The fair value approach vs the cost model has advantages and disadvantages. In rising real estate markets, it may be advantageous for real estate corporations to use the fair value model to record unrealized profits on the income statement (Danbolt & Rees, 2008; and Barth & Clinch, 1998). Unrealized gains and losses, of course, can be significant in comparison to a real estate company's rental and other income. As a result, revenue volatility may occur as real estate values vary in response to market conditions. As a result, managers may believe that include unrealized gains and losses in net income is not useful, and they may continue to use the cost model in accounting for investment properties, with fair value information de-emphasized and confined to the notes to the financial statements. In order to lower the probability of debt covenants being breached and to increase the firm's negotiating leverage in debt negotiations, managers employ income-increasing accounting policies (Norman and Kamran, 2005). This signifies that leverage management's earnings trajectory could go up or down. For instance, DeFond and Jiambalvo (1994) search for ways to make additional money available to troubled companies without raising their debt burden. Additionally, DeAngelo and DeAngelo (1994) discovered that accruing lower than expected income decreases a business's ability to get better contract terms. Many researchers have utilized leverage as a surrogate for possible association with earnings management when analyzing the effect of debt covenants (DeFond et al., 1994).

South African REITs have higher willingness to borrow in order to provide dividends to shareholders due to incentives strategy in place (Kasozi & Ngwenya (2015).

3.1.3. Dividend Yield (DY) and Earnings Management

According to a review of the literature, management of earnings has an impact on the dividend policy of corporations (Ali Shah et al., 2010; Kazemi et al., 2014). Firms' reported earnings do not reflect their real performance or ability to pay dividends since they alter their earnings statistics (indicating earnings management) for a variety of reasons including enticing investors, satisfying shareholders and creditors, etc (Chansarn & Chansarn, 2016). With this, the management of earnings consequently has an effect on the dividend policy for sure; by implication, the stock price rises when a firm uses earnings management to boost its reported results in order to attract investors. A financial manager faces a daunting task when it comes to developing a sound dividend policy. Shareholders' confidence should rise as a result of this approach and it should also be beneficial to the firm. Dividend policy was pioneered by Lintner (1956); the paper examined the process through which firm managers arrive at their dividend policy. Further, it was discovered that dividend rate serves as a benchmark for the company's management. The choice to lower payouts is a difficult one for the firm's management. When a company is in its early stages, it may not pay dividends since it is concentrating on growth and maintaining its earnings. When capital markets are believed to be flawless, dividend policy is irrelevant (Miller & Modigliani, 1961). Litzenberger & Ramaswamy (1979) in terms of earnings management established that dividend policy is significant in the context of imperfect markets. A firm's dividend policy and earnings are strongly linked; Kaasen et al (1999) provided evidence on the concept of dividends influencing earnings management. The paper noted that shareholders wanted substantial returns in anticipation of a smooth dividend influx; with this, Earnings management was therefore promoted in order for firms to show sufficient income for dividends.

Evidence of dividend-stimulated earnings management was identified by Kato et al., (2001); their paper revealed that banks use their earnings to maintain their position at the top of the market. The proportion of independent directors' equity stake reveals their motivations, as shareholders, to carry out their responsibilities as controllers successfully. Participation in firm share capital by external directors does in fact motivate them to exert influence on executive behavior and to challenge their decisions. These board members want to receive dividends from their company's excess cash flow. Researchers Dechow et al. and Beasley (1996) found a negative correlation between the percentage of shares held by outside directors and the breach of generally accepted accounting standards. According to Nekhili et

al. (2009), in the French context, the percentage of stock owned by non-executive directors has a negative relationship with earnings management. Shareholders' expectations for dividends rise significantly due to the firm's increased reported profitability. By implication, Arif et al. (2011) provided evidence on a possible outcome wherein managers tend to be forced to report lower profits because of the payout. Therefore, to avoid paying dividends, the managers might manipulate their earnings (Edelstein et al, 2008). The deduction infers that as long as they display a lower income and higher spending, they can accomplish their goal. Edelstein et al. (2008) confirms the findings of Kato et al. (2001) by corroborating that there are incidences of dividend-stirred earnings management, but contradicts the findings of Savov (2006), who showed that firms with higher investments had more possibilities of discretionary accruals in their earnings. Earnings management may be measured by the amount of discretionary accruals. Investments and earnings management are proven to have a detrimental impact on dividends.

3.1.4. Market to Book Value Ratio (MBvR) and Earnings Management

This association has been documented by Lang et al. (1989) and Servaes (1991) as well. The ratio of market to book value is related with firms' motivations to manage earnings. As a result of their increased sensitivity to earnings changes, low market to book ratio firms profit the most from managing their earnings (Skinner and Sloan, 2002). A surrogate for earnings management has been modeled that incorporates the book-market ratio to differentiate it from the market to book ratio's effect.

3.1.5. Return on Company's Assets (ROA) and Earnings Management

Motivated by financial incentives, managers work to increase shareholder wealth by employing business assets in the most efficient manner possible (Kasznik, 1999). In other words, past years' earnings influence the propensity to exaggerate future years' earnings, as well as match analyst expectations for future earnings. Kothari, Leone, and Wasley (2005) state that three main sorts of events have an impact on discretionary accruals activities in organizations. First, anticipated company events of interest influence discretionary accruals. The second factor is the induction of discretionary accruals by other firm-specific events. And last, discretionary accruals such as increasing ROA were motivated by boosting the company's performance. According to Kothari et al. (2005), firms with higher ROA have more events distinctive to the firm as well as discretionary accruals inspired by the financial performance of the company. Following the previous line of reasoning, Shih (2013) describes the two types of abnormal accruals, namely those related to results and those to mistakes, as “performance-related abnormal accruals. This study utilizes the return on assets (ROA) as opposed to firms' share prices to illustrate business performance.

3.1.6. Free Cash Flow (FCF) and Earnings Management

Having cash on hand after all successful initiatives have been financed, but not paid as dividends or super-dividends, is a source of conflict of interest between shareholders and managers. This is referred to by Jensen (1986) as an FCF situation. Managers' misuse of these money, i.e., the allocation of which has little to do with the interests of the firm, is the focus of this article. There are several factors to consider when determining whether or not an FCF scenario is alarming to shareholders. Aside from the fact that in firms with promising development prospects, agency charges connected to FCF issues are not substantial enough (Alonso et al., 2005; Lasfer, 2006; Gregory & Wang, 2013). Overinvestment can occur when there are not enough strong growth possibilities, which might be bad for shareholders. Leaders' propensity to inevitably encourage firm expansion to enhance its size, degree of remuneration (Jensen and Murphy, 1990) and discretion are to blame for this condition (Stulz, 1990). Repurchase of own shares and linked parties transactions (with leaders, significant shareholders, and/or directors) can also be used to extract private gains and expropriate small owners in the event of an FCF crisis. (Nekhili & Cherif, 2011). Such conduct might have a negative impact on the company's finances, cause a drop in the stock price, and lead to the replacement of managers (Opler et al., 2001; Richardson, 2006). Because of this, they may alter profits in order to hide their use of discretionary money and ease the extraction of private advantages of control (Leuz et al., 2003).

FCF and earnings management have a positive relationship, according to Jaggi & Gul (2006). Management in firms with high FCF is said to manipulate earnings upward to post strong results and maintain job security. The findings of Chung et al. (2005a) are supported by the findings of the aforementioned scholars. Discretionary accruals are used by firms with a high FCF level to cover up negative net present value (NPV) projects (Bukit & Iskandar, 2009). A study of 155 Malaysian listed firms on the Malaysian Stock Exchange in 2001 found that companies with high FCF levels were more likely to be able to manage their earnings in the short term. Rusmin et al. (2014) propose that the relationship between FCF and income-increasing accounting option is not a one-to-one relationship, but rather depends on a unique institutional characteristic. In Malaysia for instance, Rusmin et al. (2014) found a positive relationship between FCF and income-increasing accounting decision, which is somewhat relevant in Singapore, but not in Indonesia. A FCF scenario, on the other hand, provides proof of the reasons for downward earnings management, according to Chung et al (2005b). Discretionary accruals are used by organizations with high FCF and poor growth potential to lower their profit levels.

In Table 1, the study has reasons to believe a relationship between earnings management and the adopted variables based on a number of accounting literature.

Table 1: Relationships among Variables: REITs Earnings Management

S/No	Variable	Paper	Relationship with Earnings Management
1	Leverage (Debt/Equity)	Matsuura (2008); Fung &Goodwin (2013); and Salihi &Jibril (2015)	Positive
		Chou, Gombola &Liu (2006); Rodríguez - Pérez &Van Hemmen (2010) and Black, Sellers &Manly (1998).	Negative
2	Dividend Yield	Chansarn &Chansarn (2016); Kao (2014); Shah, Yuan &Zafar (2010) and Lanouar, Riahi &Omri (2013).	Negative
		He, Ng, Zaiats &Zhang (2017); and Padmini &Ratnadi (2020).	Positive
3	Free Cash Flow (FCF)	Dewi &Priyadi (2016); Kodriyah &Fitri (2017); and Chung, Firth &Kim (2005); and	Positive
		Astami, Rusmin, Hartadi &Evans (2017); Susanto, Pradipta &Djashan, (2017).	Negative
4	Market to Book Value Ratio	Han, Kang, Salter &Yoo (2010; and Capalbo, Frino, Lim, Mollica &Palumbo (2018).	Positive
		Tabassum, Kaleem &Nazir (2015); and Park &Park (2004).	Negative
5	Firm Size	Ali, Noor, Khurshid &Mahmood (2015); and Nalarreason, Sutrisno &Mardiati (2019)	Positive
		Thoopsamut &Jaikengkit (2009); and Lobo &Zhou (2001).	Negative
6	Return on Assets	Aygun, Ic &Sayim (2014); and Sun &Rath (2009).	Positive
		Alhadab &Al -Own (2017); and Leggett, Parsons &Reitenga (2009).	Negative

4.0. Hypotheses Formulation & Data Sources

4.1. South African REIT Management Structures/Styles and Earnings Management around SEOs

Capozza & Seguin (2000) documents that REITs that delegate asset and liability management decisions to internal employees generally pay managers based on corporate cash flows rather than property cash flows for their work; additionally, the important design element is the simultaneous existence of several forms of management contracts and pay systems among the publicly listed REIT companies. When REITs are managed externally (i.e., by advisers),

there is a mismatch of incentives, according to Sagalyn (1996), but conflicts of interest are less likely with internal management. An important distinction is not whether a management and shareholder have an arm's-length relationship or not, but rather whether contracts exist that reward external advisers based on criteria different from shareholder wealth. Most external advisers are paid as a percentage of assets, as a percentage of property-level cash flows, or as a mix of the two.

4.2. Management Structures and Earnings Management

It is the tasks and procedures of a firm's internal governance that are designed to monitor and influence the actions of its management. Maintaining the credibility of a company's financial statements is a primary function of these systems in connection to financial reporting (Dechow et al., 1995). Board of directors is an essential internal control tool for monitoring the actions of senior management and maybe the use of accruals to manage earnings. Fama (1980) & Fama and Jensen (1983) argue that the efficacy of the board is a function of the board's makeup. According to them, the corporate board's internal control is strengthened by the presence of non-executive members. However, agency theory suggests that external directors, due to their independence and organizational capabilities, provide an effective regulatory system for executive directors' activities (who are perceived to favour opportunism) since they have a unique perspective on the firm (Rediker & Seth, 1995). Because external directors/managers have incentives to cultivate track records as experts in regulated decision-making, they have the potential to be more successful (Fama & Jensen, 1983). The board can be viewed as a means by which managers exert control over their subordinates. Researchers usually agree that external management is crucial for management monitoring and supplemental knowledge (Booth et al., 2002). Further, a number of studies have also provided evidence on the impact of management structure on limiting opportunistic earnings management action. Some studies asserted that external managers on a board appears to restrain the action of the board in relation to earnings management (Klein, 2002; Peasnell et al., 2000, 2005, 2006; Benkel et al., 2006; Benkraiem, 2009). Financial statement fraud has been studied extensively by Beasley (1996), Dechow et al (1996), and Uzun et al (2004), among others. A correlation between irregular accruals and the percentage of external managers on a firm's board has been identified by Klein (2002), using data from the United States. Management structures and earnings management were also examined using a sample of firms in the United Kingdom by Pope et al. (1998). The paper suggested that a more diverse board of directors would limit earnings management; apart from this, the paper established a significant relationship between the percentage of external

board members and the growth in income accruals. On the basis of the Cadbury Committee Report of 1992, Peasnell et al. (2000) provided evidence on the relationship between board composition and earnings management. While the paper found no indication of a relationship between management structures and earnings management, it indicated a strong negative correlation between the percentage of external managers and the amount of income-increasing accruals. Howe & Shilling (1990) found that externally managed REITs experience negative abnormal returns over the 1973 to 1987 period on average. Whereas, Hsieh & Sirmans (1991) and Cannon & Vogt (1995) found that internally managed REITs outperformed externally managed REIT's over their 1987 to 1992 sample period. Also, Capozza & Seguin (2000) established that compared to domestically managed REITs, externally managed REITs issue loans with lower projected interest rates. Higher debt use in externally managed REITs may not explain all of the rising interest rates. It also is worth noting that these debt contracts come with interest rates that are higher than those on the borrowed funds. The usage of debt that has been negotiated at rates that appear to be above market rates has the effect of reducing shareholders' cash flows.

4.2.1 Externally Versus Internally Managed REITs: Benefits and Features

The activities of the "manager" and the "advisor," respectively, in REIT management include investing and property management. Property managers are in charge of managing property sites; their responsibilities include leasing and facility operations such as maintenance, engineering, tenant relations, onsite construction management, property-level accounting, and so on. Investment management advisors are in charge of selecting and managing assets in order to carry out the REIT's investment plan; their responsibilities include providing recommendations on property purchases and disposal. The IREIT model is notable in that it should be handled externally. The projected IREIT regulations make no distinction between asset management ("advisor") and property management ("manager"). External management is required for overall management. This is analogous to early REITs in the United States (before to 1968), which were obliged to be externally advised. In turn, the adviser would employ managers, leasing brokers, and subcontractors. The idea was to retain REITs as passive investment vehicles. The United States started to enable REITs to be "self-advised" and "self-managed" in 1986 (Ambrose & Linneman, 2001). The trust in an IREIT will designate a management company (or LLP) to be in charge of asset management and property management. In total, approximately 50% of worldwide REITs are advised and managed internally, whereas roughly 30% are advised and managed externally (Das & Thomas, 2016).

Markets with extensive REIT experience tend to have even more internally advised REITs. Externally advised REITs are common in developing REIT markets, particularly in Asian economies. Companies favor internal advising when laws allow, but are less picky about internal management. The sole exception is Mexico, where roughly 70% of REITs are externally managed but internally managed, while the remainder are both advised and managed. According to Cashman et al. (2014), external management is popular in less stable economic and political situations, higher levels of corruption, worse disclosures, or inadequate property rights protection. The bulk of REITs (60–75 %) in developed countries with a saturation point of REITs (e.g., the United States, the United Kingdom, and Australia) are internally advised and managed. Developed markets (e.g., the United States, the United Kingdom, Australia, Belgium, Canada, and France) with a high number of REITs are dominated by internal advisers (60–85 %) and, while still significant, are less controlled by internal managers. In contrast, all REITs in Japan and Singapore are both advised and managed by third parties. It is worth noting that REITs in Japan and Singapore were designed after Australia when it introduced external management. Although Australian REITs are now internally advised and managed, REITs in Singapore and Japan are still externally advised and managed. Several REITs (11 – 13 %) in developed markets such as the United States, United Kingdom, and France are externally advised and managed. Half of Hong Kong's real estate investment trusts (REITs) are advised and managed by third parties. Countries where REITs are still in their early stages (for example, Finland, Ireland, and the United Arab Emirates) choose externally advised and managed arrangements. Property owners are sometimes hesitant to hand up power to managers since external advising services involve investment management. As a result, some property owners are hesitant to convert their properties into REITs. Other challenges arising from this paradigm include agency issues and conflicts of interest, particularly in circumstances when a management business services many customers. Clearly, as Cashman et al (2014) reiterated, the choice of external versus internal advisor is a function of the estimated agency costs. Indeed, earlier externally-managed REITs underperformed. Howe and Shilling (1990) reported that from 1973 to 1987, the risk-adjusted performance of externally-advised REITs was worse than the overall market. In 1986, the U.S. Tax Reform Act (TRA) took the drastic step of allowing REITs to be internally managed. Recently, REITs are pre-dominantly self-advised (Nicholson & Stevens, 2021)

4.2.2. Costs and Benefits of External Managers

When comparing external vs internal advisers or managers, studies have shown varying results. For example, Brockman et al. (2014) discover that, whereas externally managed REITs underperformed until 1993, the underperformance did not last due to rising institutional

ownership. They claimed that better monitoring from institutional ownership raised the performance of externally managed REITs to that of internally managed ones. Das and Thomas (2016), on the other hand, indicate that internally-managed REITs are no better at reducing general and administrative (G&A) expenditures. Internally managed REITs, on the other hand, have 20 basis points greater management expenses in terms of market value. They discover that the efficiency ratio range (G&A expenditure divided by total revenue) in domestically managed vs externally managed REITs is 5%–7% and 4%–6%, respectively. According to Yong & Singh (2013), when internally managed REITs engage in a broader range of operating activities, they become more vulnerable to market and financial risk.

4.2.3. Costs and Benefits of External Advisors

According to Brockman et al. (2014), while the choice of external vs internal management has a negligible influence on REIT returns, the choice of internal versus external adviser type is essential. Specifically, whether property-level operations are managed internally or externally has little impact on REIT performance. However, it is recognized that whether asset management (investment in and disposition of properties) is performed by internal or external managers makes a difference. According to Howe & Shilling (1990), insurance companies and specialist real estate consulting services firms provide superior advice than others. Engaging external managers or advisers may enhance a REIT's performance, especially for REITs with regionally broad asset portfolios or heterogeneous asset holdings (Deng, et al, 2014). It is suggested that local ("external") advisers have access to "soft information" and are therefore more capable of overcoming some of the difficult problems often connected with the features stated above (Cashman, et al., 2014). Externally advised REITs are also seen as more transparent. As a result, analyst expectations are less scattered, bid-ask spreads are narrower, and share prices are less volatile. However, external advisors may be more costly. Another downside of external advisors is related to self-dealing. For example, an advisor may acquire for the REIT an overpriced asset in which it has ownership interest, or sell assets at low price to a related buyer.

Below is Table 2 showing a sample of internally and externally managed REITs around the world. This is followed by Table 3 which shows South African REITs and their management structures. Externally managed REITs are believed to have greater governance, better frameworks, and better alignment (Lecomte & Ooi, 2013; Omokhomion, et al., 2018; Kudus & Sing, 2011; and Yap, et al., 2018). In reaction to the financial crisis and accompanying regulatory revision, institutional fund management platforms have tightened internal controls, systems, procedures, and investor communication (Waldron, 2018). They are now

aiming to diversify capital sources and, where feasible, develop new products that complement existing fund offerings, such as performance-based fee structures and strong governance controls (Wenceslao, 2008; Joseph, Graeme & Tien-Foo, 2006). As a result, new, externally managed listed firms in the United States and across the world with structures that better alleviate many of the traditional alignment, cost, and governance difficulties are becoming more common. Listed REIT products are now enabling access to best-in-class fund platforms to retail and institutional investors of all sizes. With this, investor confidence is lured due to the impact of externally managed REITs' corporate governance outlook (Chong, et al., 2017). A possible case of investors being lured to buy more SEOs of externally managed REITs than their internal counterparts is perceived.

Table 2: Sample of Internally managed vs. Externally managed REIT 2021 globally

REIT/Year of Origin	Internal Management	External Management	Market Capitalization (USD)
US (1960)	251	41	1.33 Trillion
UK (2007)	36	19	74 Billion
Netherlands (1969)	11	0	0.77 Trillion
France (2003)	28	11	76 Billion
Belgium (1995)	23	9	16 Billion
South Africa (2013)	29	5	36 Billion
Italy (2007)	6	3	5.1 Billion
Australia (1985)	28	13	103 Billion
Ireland (2013)	4	9	5.3 Billion
Spain (2009)	4	11	28.2 Billion
Mexico (2004)	6	13	17.5 Billion
Hong Kong (2003)	4	8	11.1 Billion
Singapore (1999)	4	41	73.3 Billion
Japan (2000)	6	62	147.2 Billion

Author's Compilation

The study contends that managers' subpar performance can be explained by taking a close look at the money they receive. For the most part, external managers are paid as a proportion of either the overall assets managed or the cash flows from individual properties. Interest expenses have no effect on the pay of either party. Because of this, they have no need to bargain for lower interest rates. For this reason, external management are compelled, regardless of interest rates, to issue debt to fund the purchase of further real estate. With the need to issue debt and the inability to offer competitive interest rates, it is possible for stock value to fall. With the above literature inconsistencies, the study then hypothesized that a relationship exists between management structures of firms (REITs) and tendency to manage earnings irrespective of the degree.

Hypothesis 1A: Internal Management of REITs will increase earnings management behavior around SEOs
Hypothesis 1B: Internal Management of REITs will not increase earnings management behavior around SEOs
Hypothesis 2A: External Management of REITs will reduce earnings management behavior around SEOs
Hypothesis 2B: External Management of REITs Table 3: South African REITs and their Management

Structures/Classificationswill not reduce earnings management behavior around SEOs

REITs	Management Structure	REITs Sector	Date of Listing	Market Cap	P/E Ratio	Dividend Yield (%)	Return on Equity	Return on Assets	Net Asset Value	Issued Shares
ACCPROP ACCELERATE PROPERTY FUND LTD	Internally	Diversified	December 2013	5,392,035,675	10.16	10.57 %	8.7 %	4.61 %	743.87	989,364,344
ARROWHEAD PROPERTIES LTD	Internally	Diversified	December 2011	6,982,192,384	8.01	13.16 %	9.97 %	9.36 %	1,103.91	1,049,953,742
CAPITAL & REGIONAL PLC	Externally	Retail	December 1995	6,938,543,842	27.17	6.34 %	5.03 %	5.38 %	1,152.60	718,275,760
DELTA PROPERTY FUND LTD	Internally	Diversified	November 2012	4,413,435,813	6.82	15.76 %	6.98 %	10.02 %	973.87	711,844,486
DIPULA INCOME FUND LTD A	Internally	Diversified	December 2011	9,311,051,201	11.04	9.27 %	9.2 %	9.53 %	1,012.62	219,197,046
DIPULA INCOME FUND LTD B	Internally	Diversified	December 2011	2,463,134,245	7.13%	3.14%	9.2 %	9.53 %	1,012.62	229,128,767
EMIRA PROPERTY FUND LTD	Internally	Diversified	November 2003	7,646,621,824	14.47	9.79 %	8.06 %	6.66 %	1,734.70	522,667,247
EQUITES PROPERTY FUND LTD	Internally	Logistics	June 2014	8,178,967,953	14.34	5.86 %	14.83 %	7.11 %	1,522.00	409,973,331
FAIRVEST PROPERTY HOLDINGS LTD	Internally	Diversified	November 1998	3,765,255,297	10.66	8.94 %	17.52 %	14.69 %	218.18	861,100,145
FORTRESS REIT LTD A	Internally	Logistics and Retail	October 2009	20,160,129,375	5.91	8.16 %	30.85 %	1.9 %	1,739.00	1,184,496,438
FORTRESS REIT LTD B	Internally	Diversified	October 2009	29,183,891,080	5.91	8.16%	30.85 %	1.9 %	1,739.00	1,086,114,294
GROWTHPOINT PROPERTIES LTD	Internally	Diversified	December 1987	47,597,799,587	15.67	6.96 %	10.73 %	7.35 %	2,518.00	2,934,202,472
HAMMERSON PLC	Externally	Retail	December 2015	21,052,970,823	16.06	5.18 %	9.51 %	5.19 %	12,858.17	794,227,196
TSOGO SUN HOSPITALITY PROPERTY FUND LTD	Internally	Hospitality and Leisure	February 2006	1,417,511,698	9.06	11.54 %	3.46 %	4.48 %	2,009.00	578,154,207
HYPROP INVESTMENTS LTD	Internally	Retail	December 1987	9,408,041,789	17.12	6.3 %	11.04 %	6.89 %	9,978.00	248,441,278
INVESTEC AUSTRALIA PROPERTY FUND	Externally	Retail	December 2012	10,166,278,479	7.71	9.23 %	19.25 %	7.5 %	122.80	478,802,454
INDLUPLACE PROPERTIES LTD	Internally	Residential	June 2015	1,063,399,588	9.52	10.51 %	8.34 %	8.46 %	1,029.98	318,645,117
INVESTEC PROPERTY FUND LTD	Internally	Diversified	December 2011	6,324,097,363	15.63	8.02 %	7.79 %	8.97 %	1,694.00	731,400,437
LIBERTY TWO DEGREES	Internally	Retail	November 2018	4,540,079,672	26.03	4.2 %	6.95 %	6.31 %	994.00	908,443,334
OCTODEC INVESTMENTS LTD	Internally	Diversified	November 1990	6,816,900,958	10.54	11.25 %	8.78 %	7.18 %	2,933.00	266,864,319
ORION REAL ESTATE LTD	Internally	Diversified	2005 – 2019; 2020 – Date	409,954,147	125	5 %	-1.19 %	-0.48 %	94.67	630,698,688
RDI REIT P.L.C	Externally	Diversified		11,145,027,389	13.21	7.8 %	9.13 %	6.42 %	680.81	1,905,132,887
REBOSIS PROPERTY FUND LTD B	Internally	Diversified	December 2010	6,591,506,936	13.14	13.11 %	22.26 %	6.6 %	1,844.55	673,289,779
REBOSIS PROPERTY FUND LTD A	Internally	Diversified	December 2010	1,641,753,011	0	0	22.26 %	6.6 %	1,844.55	63,266,012
REDEFINE PROPERTIES LTD	Internally	Diversified	December 1999	26,127,256,264	-6.75	0	7.38 %	4.09 %	719.74	5,793,183,207
RESILIENT REIT LTD	Internally	Retail	December 2002	22,211,008,360	79.12	7.72 %	1.06 %	-1.73 %	5,213.00	400,126,254
SA CORPORATE REAL ESTATE LTD	Internally	Diversified	December 1995	5,532,410,609	5.73	12.82 %	5.8 %	6.58 %	383.00	2,514,732,095

Author's Compilation

5.0. Data Sources

In this paper, the study used 476 SEOs issued by 34 REIT firms (based on availability of data) from January 1, 2013 to December 31, 2021. The number of SEOs was retrieved from the Stock Exchange News Service (SENs) of the Johannesburg Stock Exchange (JSE). The study did not find consistent data on SEOs for 2020 and 2021; hence, the study commenced the study period in 2013 till 2019, being motivated by the evolution of the REITs regime in South Africa. The sample includes all classifications of REITs for the purpose of the study. Financial ratios and stock accounting data were retrieved from IRESS Expert database. The 34 SAREITs were further categorized into internally managed and externally managed firms (with information retrieved from the SENs) for comparison with a view to examining the degree of earnings management around SEOs. The numbers of internally managed REITs are 29 while the numbers of externally managed REITs are 5. The study first measures earnings management through its discretionary accruals proxy; it then use the multivariate and univariate ordinary least square (OLS) specifications to test the hypotheses. OLS regressions have been argued as the most suitable model for capturing long time-series; apart from this, the OLS-based Jones model is preferred in detecting simulated earnings management (Höglund, 2013; and Ambrose & Bian, 2010). More recently and specifically, Morri, et al (2020) noted that the OLS model is best suited at investigating whether there is a significant relationship between excess dividends and a small set of covariates including samples of ratios adopted in this study (free cash flow, size and ROA). Subsequently, an alternative proxy for discretionary accruals is adopted for the purpose of the study.

5.1. Measuring Earnings Management in Financial Statements: The Discretionary Accruals Phenomenon

Extant studies (Jones 1991; Defond and Jiambalvo 1994; Teoh 1998; Rangan 1998, Zhu et al (2010); Cohen and Zarowin (2010); Ghazali, Shafie and Sanusi (2015); Jackson (2018)) have all often-measured earnings management using discretionary accruals. Jackson (2018) for instance opined that the discretionary accruals are widely used in literature. The paper documented how the use of basic econometrics explains discretionary accruals estimation. Interestingly, the paper criticized the proxy as a measure noting that many researchers often do not consider the underlying econometric nature of same proxy and how it is interpreted. Rangan (1998) also documented that earnings management is best measured using the discretionary accruals; the paper equally noted that discretionary accruals are best effective

in the quarter during which stock prices are announced and in the next quarter. Further, the discretionary accruals is measured by the total accruals. To generate the non-discretionary accruals component, a model is then adopted with a view to categorizing the discretionary and non-discretionary components. Such models range from Jones Model, Modified Jones Model, M-score Model, to Industry Model, etc. Motivated by prior real estate studies, the Modified Jones Model is used in this study (Liang & Dong, 2018; Anglin, et al., 2013; An, et al., 2011; Islam, et al., 2011 and Zhu, et al., 2010). In recent times, this appears to be the most widely used approach for detecting instances of earnings management/manipulation. The assumption in the Jones model and the cross-section Jones model is that any variations in revenue are non-discretionary. Managers, on the other hand, have the option of using credit sales to control their revenues. Dechow et al. (1995) adjusted the Jones model by subtracting the variance of receivables (ΔREC) in order to determine this; hence, the study adopted the modified Jones model proposed by Dechow et al. (1995) which is commonly used in the studies on earnings management to estimate discretionary accruals (Peasnell et al., 2005; Frankel et al., 2002; Haw et al., 2004; Rahman & Ali, 2006). The modified Jones model consists of regressing total accruals (TACC) on three variables:

the change in revenues (ΔRev);
the change in receivables (ΔRec); and
the level of gross property, plant and equipment (PPE).

Discretionary Accruals:
TACCiτ = α0(1/Aiτ-1) + α1(ΔREViτ - ΔRECiτ/(Aiτ-1) + α2(PPEiτ/ Aiτ-1) + Ɛit
Where:
TACCiτ: the sum of total accruals in year t
Aiτ-1: the sum of assets in year t-1
ΔREViτ: the change in revenues between years t and t-1
ΔRECiτ: the change in receivables between years t and t-1
PPEiτ: the sum of the property, plant & equipment in year t
Ɛit: statistical error

DA0 = α0 + α1*DE - α2*DY - α3 *FSIZE - α4 *MTB + α5 * ROA + α6 *FCF + α7 *ManagementStructure
The independent variables are time-varying covariates.

$$DA0 = \alpha 0 + \alpha 1 * DE - \alpha 2 * DY - \alpha 3 * SIZE - \alpha 4 * MTB + \alpha 5 * ROA + \alpha 6 * FCF + \alpha 7 * ManagementStructure + \varepsilon_i, \quad t = 1, 2, 3..T$$

5.2. Control Variables

This research focused on previous studies that used variables to control for earnings management, which is in line with investigating the incidence of earnings management within the different management structures of REITs in South Africa. On the basis of this, the study employs variables which explains earnings management of REITS (due to the availability of data) in Table 4. With Debt/equity ratio (LEVERAGE), analysts and investors use the debt-to-equity ratio to determine how much debt a company has in relation to the equity they possess or the shareholders own. The firm has a wide range of finance requirements in order to effectively execute its activities (Matsuura, 2008). As a proxy for how close a firm is to breaching its covenant obligations, most accounting choice research has looked at the debt-to-equity ratio. This study has revealed that when the ratio is high, managers are more likely to pick accounting practices that increase earnings. For more than 60% of the limits on retained earnings, working capital, and net tangible assets, the results of Duke and Hunt (1990) imply that the debt-to-equity ratio is a suitable proxy for the presence or absence of debt covenant constraints. The higher the debt-to-equity ratio, the more likely it is that business activity will raise income; hence, a positive correlation. Dividend Yield (DY) is expressed as the financial ratio (dividend/price) which indicates how much a firm pays out in dividends per year in relation to the stock price, and calculated as a percentage (Christie, 1990; Chen, et al., 1990; Asquith & Mullins Jr, 1986; Ong, et al., 2011 and Elliott, et al., 2009); dividends are a way for a corporation to give back to its owners. A method for returning cash or assets to shareholders has been disclosed as well as a strategy for paying funds to those shareholders (Jensen, 1986). Free cash flow can be distributed to shareholders via dividends.

However, when firms must limit dividends, they are on the verge of entering into a debt agreement. Managers may be motivated to manipulate earnings and keep the dividend hikes coming if this scenario occurs (Barkhordar & Tehrani, 2016). Firm Size (SIZE) Syed Zulfiqar et al. (2010) claim that dividends can be utilized as a feature to forecast income or as a predictor of dividend. These scholars further argued that if a corporation reduces its shareholder dividend, it can be seen as a solution to alleviate the firm's difficulty; ultimately, this is earnings management. The relationship between firm size and earnings management has been studied using agency theory by Barton and Simko (2002) and Ali et al (2015). Financial analysts have high expectations of large firms, thus they often engage in earnings management to meet those expectations (Turegun, 2016). Conversely, research by Kim (2003) and Swastika (2013), on the other hand opined that same large firms possess adequate organizational controls. Furthermore, the scholars noted that as a matter of fact, large firms

are frequently audited by one of the big accounting firms, reducing the likelihood of engaging in financial reporting manipulation. A number of prior studies have found conflicting outcomes when it comes to the relationship between the amount of leverage a firm has and its size. The market to book value ratio (MTB) is also believed to be linked to the incentives of firms to control earnings. To compensate for their greater sensitivity to earnings swings, low market to book value ratio firms stand to gain more from earnings management and so have higher incentives to manage earnings (Skinner & Sloan, 2002). Return on assets (ROA) measures how much a firm may make from its assets while still making a loss (Yuliana & Trisnawati, 2015). It is indeed possible that a decline in earnings will make the company less appealing to investors. Firms that generate a lot of returns will be more motivated to make money-driven decisions in order to keep or even enhance their profits year after year (Wiyadi et al., 2015). Free cash flow (FCF) and earnings management have a positive relationship, according to Jaggi & Gul (2006). Management in firms with high FCF is said to manipulate earnings upward to post strong results and maintain job security. The findings of Chung et al. (2005a) are supported by the findings of the aforementioned scholars. Discretionary accruals are used by firms with a high FCF level to cover up negative net present value (NPV) projects (Bukit & Iskandar, 2009).

Table 4: Model Specification - Earnings Management and Financial Ratios/Control Variables

Dependent Variable	
DA (Earnings Management Proxy/Measure)	Earnings Management: Discretionary accruals are often used to measure the dependent variable, EM. The Jones Model calculates discretionary accruals. The Jones model (1991) is a widely used model for measuring earnings management.
Independent variables (Firm Level)	
DE	Debt/Equity ratio: Book value of total liabilities divided by book value of equity, computed by using data from the year preceding SEO announcement
DY	Dividend yield: The financial ratio (dividend/price) which indicates how much a firm pays out in dividends per year in relation to the stock price, and calculated as a percentage
FSIZE	Firm Size: The value at which the shares of a company's stock is estimated
MTB	Market to Book value Ratio: The measure is used to equate a company's available net assets to the price at which the stock is sold
ROA	Return on Assets: Net income divided by book value of assets, computed by using data from the year preceding SEO announcement
FCF	Free Cash Flow: calculated as sales revenue - (operating costs + taxes) - required investments in operating capital.
MANAGEMENT STRUCTURE	Internally and Externally Management: Internally managed REITs hire their own personnel, analysts, managers, and executives to handle the firm's assets as opposed to externally managed REITs. Internally Managed – Dummy Variable 1 Externally Managed – Dummy Variable 0

6.0. Results

The aim of this study is to estimate the degree of earnings management using discretionary accruals (modified jones model) between internally managed REITs and externally managed REITs for the study period. The chapter starts with providing descriptive stats, followed by trends analysis, correlation and Ordinary Least Squares regression.

6.1. REITs SEOs by year, and management type

The distribution of the REITs is seen in the table below. The time-series of SEOs and management structures are presented in the following table below (Table 5) (i.e., internally

managed versus externally managed REITs). There has been an overall increase in the number of businesses that have issued SEOs during the course of the study period. The year 2014 saw the highest amount of observations, with 179 SEO concerns being identified. In South Africa, this may be traced back to the era around the implementation of the REITs system (2013). Indeed, an obvious decline in SEOs is witnessed in the years captured within the Covid-19 phenomenon. Hsu, et al. (2021) and Halling, et al. (2020) had observed that the pandemic panic phase saw stocks prices in various sectors of listed companies fall sharply due to investors' projected rationality. Further, as a result of the spread of Covid-19, both IPOs and SEOs are excluded for the purpose of robustness testing.

Table 5: Distribution of REITs SEOs by year, and Management Type

SEO Year	Internally Managed	Externally Managed	Total
Distribution by Year and Management type			
2013	18	26	44
2014	56	123	179
2015	26	51	77
2016	17	48	65
2017	47	64	111
2018	20	31	51
2019	13	42	55
Total	202	388	590

6.2. Summary Statistics

Table 6 presents a mean comparison of all variables for REITs that are managed internally compared to those that are managed externally. The findings demonstrate that the mean value for Discretionary Accruals (DA) in externally managed REITs (9.5, standard deviation=1.7) was somewhat higher than the mean value for DA in internally managed REITs (9.74, standard deviation=2.6). When comparing FIRMSIZE in externally managed REITs to FIRMSIZE in internally managed REITs, the former was 1.9 times larger/higher. The word "FIRMSIZE" refers to the natural logarithm of 2010 total assets of firm i. It is defined as the sum of the market values of all of the shares that are currently outstanding (Anglin et al., 2013). When it comes to corporate capital, leverage, also known as the debt-equity ratio, measures the proportional contributions of creditors and shareholders or owners to the total amount of capital utilized in the firm (Ambrose & Bian, 2010). LEVERAGE levels in externally managed REITs (0.84, standard deviation = 0.77) were much lower than those in internally managed REITs (6.2, standard deviation = 36). DIVIDEND YIELD, also known as the financial ratio, is a measure of how much a company pays out in dividends every year in proportion to the price

of its shares. It is expressed as a percentage of the stock price.

The DIVIDEND YIELD in externally managed REITs (14.1; standard deviation = 37.2) was greater than the DIVIDEND YIELD in internally managed REITs (9.8; standard deviation = 10.4). When it comes to RETURN ON ASSETS (ROA), the findings demonstrate that the ROA in externally managed REITs (5.9 percent; SD=7.1) was somewhat lower than the ROA in internally managed REITs (6.1 percent; SD=6.1); nevertheless, this difference is minor. Furthermore, the descriptive data reveal that TOTAL ASSETS in externally managed REITs were marginally lower (6.7; SD=10.6) than those in internally managed REITs (7.6; SD=8.3) as compared to those in internally managed REITs. In externally managed REITs, the mean MARKET TO BOOK VALUE RATIO (0.87) was 15 times lower than the mean MARKET TO BOOK VALUE RATIO in internally managed REITs (13.5; SD=132). When comparing internally managed REITs to externally managed REITs, FREE CASH FLOW (FCF) was 1.3 times greater in internally managed REITs (243,363; SD>100) than in externally managed REITs. Findings also reveal that the mean value of discretionary accruals in internally managed REITs is less than values inherent in externally managed REITs; by implication and interestingly, South African externally managed REITs manage their earnings more than their counterparts.

Table 6: Summary Statistics for internally and externally REITs in a matched sample

	Externally Managed REITs			Internally Managed REITs		
Variable	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
Panel A: Earnings Management Proxy/Measure						
DA	388	9.497	1.701	202	9.743	2.58
Panel B: Control Variables						
Firm Size ('000s)	388	7,160,000	13,100,000	202	13,400,000	17,900,000
Leverage (Debt/Equity)	388	1	1	202	6	36
Dividend Yield	388	14	37	202	10	10
Return on Assets	388	6	7	202	6	7
Free Cash Flow (FCF)	388	185,573	324,806	202	243,363	432,678
Market to Book Value	388	1	0	202	13	132
Panel C: DA Variables						
Current Liabilities	388	1,446,728	2,927,914	202	2,200,729	2,461,585
Current Assets	388	1,446,728	2,927,914	202	2,200,729	2,461,585
Amortisation	388	-	-	202	-	-
Total Assets	388	7	11	202	8	8
Receivables	388	205,051	348,358	202	554,271	846,787
PPE	388	199,770	713,585	202	1,044,047	4,447,983
Depreciation	388	9,519	28,892	202	3,759	12,152
Revenue	388	471,276	630,805	202	1,161,108	2,919,826

NOTE: Above presents the summary statistics for internally and externally REITs in a matched sample. Using Mean and Standard Deviation values, discretionary accruals in internally managed REITs is less than values inherent in externally managed REITs; by implication and interestingly, South African externally managed REITs manage their earnings more than their counterparts.

6.3. Overall Discretional Accruals (2013 - 2019, all REITs)

Table 7 indicates that the average discretionary values between 2013 and 2019 (although, 2020 and 2021 were excluded due to inconsistent data) in this sample were negative. For each percentile, we compute a 95% confidence interval around the mean Discretionary Accrual (DA). The results reveal that the null hypothesis of zero DA is rejected at the 0.05 level for percentiles representing lower and higher levels of earnings (a type I error). Surprisingly, the results show that aggressive earnings management (Discretionary Accruals) practices in externally managed REITs were relatively higher compared to internally managed REITs, although negative. By implication, we therefore reject the null hypothesis. The prediction is therefore inconsistent with extant literature which had earlier established that external managers on the board of a firm appear to restrain earnings management activities (Klein, 2002; Peasnell et al., 2000, 2005, 2006; Benkel et al., 2006; Benkraiem, 2009). In comprehending the uniqueness of the findings, it is reasonable to assume that earnings management is motivated by a desire to postpone or minimize the release of negative news to investors (Peasnell, et al., 2005).

Another possible reason for these findings is that the negative discretionary accruals discovered in this study are due to poor financial performance and distress among both internally and externally managed REITs. The study observes that, as a result of financial distress and the inability to express a going concern modification (GCM), issuing firms can manipulate their stock prices by managing earnings, and the market appears to extrapolate earnings growth associated with negative discretionary accruals and thus overvalues the issuing firm (Yuanwei, 2009; Ajona, et al., 2008). Prior REITs-specific research (Dempsey et al., 2012; and Ambrose & Bian, 2010) offer an equally compelling justification for boosting earnings management activities among financially distressed firms. Dechow et al. (1995) show that in organizations with exceptional performance, discretionary accruals are skewed.

Table 7: Overall Discretional Accruals (2013 - 2019, all REITs)

	Discretionary accruals (DA)			
	Percentiles	Smallest		
1%	-69	-68.98		
5%	-65.9	-65.94		
10%	-65.6	-65.60	Obs	22
25%	-63.4	-64.54	Sum of Wgt.	22
50%	-55.2		Mean	-55.70
		Largest	Std. Dev.	7.66
75%	-51.1	-47.83		
90%	-44.6	-44.61	Variance	58.66
95%	-43.4	-43.42	Skewness	0.01
99%	-42.6	-42.57	Kurtosis	2.04

Variable	Obs	Mean	Std. Dev.	Min	Max
DA_internally managed REITs	8	-53.06	9.09	-65.60	-42.57
DA_externally managed REITs	13	-56.95	6.79	-68.98	-47.83

6.4. The Augmented Dickey-Fuller (ADF) Unit Roots Test

All the test statistic, except DEBT/EQUITY RATIO (LEVERAGE), DIVIDEND YIELD and REVENUE, are greater than the critical value, with a corresponding Mackinnon p-value that are greater than the recommended 5%; hence, we conclude that there is presence of unit roots. By implication, the presence of a unit root in a series mean that there is more than one trend in these series. This therefore justifies the need to transform the data to natural logarithm. Data series for LEVERAGE, DIVIDEND YIELD and REVENUE are stationary (does not have unit roots as the p-value is significant at 5% level). The results for the Augmented Dickey-Fuller tests for all the variables are shown in the Table 8:

Table 8: The Augmented Dickey-Fuller (ADF) Unit Roots Test

Interpolated Dickey-Fuller Unit Root Test								
		Statistic	1% Critical value	5% Critical value	10% Critical value	MacKinnon p-value for Z(t)	Unit root	Stationarity
Panel A: Control Variables								
ROA	Z(t)	-0.81	-3.75	-3	-2.63	0.8162	No	No
Dividend Yield	Z(t)	-10.106	-3.75	-3	-2.63	*0.000	No	Yes
Free Cash Flow	Z(t)	-3.315	-3.75	-3	-2.63	*0.0142	No	Yes
MBVR	Z(t)	-2.26	-3.75	-3	-2.63	0.1851	Yes	No
FSIZE	Z(t)	-0.781	-3.75	-3	-2.63	0.8246	Yes	No
Leverage	Z(t)	-0.86	-3.75	-3	-2.63	0.1720	Yes	No
Panel B: DA Variables								
TL	Z(t)	-0.05	-3.75	-3	-2.63	0.9542	Yes	No
TR	Z(t)	-0.452	-3.75	-3	-2.63	0.9011	Yes	No
DEP	Z(t)	-1.342	-3.75	-3	-2.63	0.567	No	No
REV	Z(t)	-3.416	-3.75	-3	-2.63	*0.0104	No	Yes
CASH	Z(t)	-0.818	-3.75	-3	-2.63	0.8138	No	No
TA	Z(t)	-0.669	-3.75	-3	-2.63	0.8546	No	No

6.5. Pearson's Correlation

In Table 9, there are strong positive correlations between DIVIDEND YIELD and discretionary accruals (Earnings Management) in both domestically (r=0.80, p0.05) and externally managed REITs (r=0.985). A rise in DIVIDEND YIELD would almost certainly result in an increase in Earnings Management. In accordance with He (2017), this paper reveals that past studies (Lintner, 1956; Skinner & Soltes, 2011) have found that paying dividends does not preclude firms from committing accounting fraud, implying that dividend paying firms may not always operate in the best interests of their shareholders. Consistent with Susanto et al. (2017), Agustia (2013), Amertha et al. (2014), and Yogi & Damayanthi (2016), FREE CASH FLOW (FCF) was significantly negatively associated with Earnings Management (r=-0.36, p0.05), with a weak effect in internally managed REITs and a twice less effect on externally managed REITs (r=-0.729); this means that a unit decrease in FREE CASH FLOW (FCF) was bound to if it is not employed to maximize shareholder earnings in the form of a profitable investment, investors will discover that the company's management is unable to give advantages to the company's owner; at the end of the day, the firm will be in a state of low growth (Jensen, 1986). When it comes to internally managed REITs, firm size (market capitalization) is highly correlated with Earnings Management (EM), however this is not the case for externally managed REITs. In this sample, DIVIDEND YIELD, LEVERAGE (debt/equity), and RETURN ON ASSETS (ROA) were not found to be associated with EM.

Table 9: Pearson's Correlation

	Internally Managed REITs	Externally Managed REITs	Full Sample REITs
	DA_ln	DA_ln	DA_1n
Discretionary Accruals	1	1	1
Dividend Yield	0.8042*	0.9852*	0.8319*
Leverage_1	-0.1584	-0.2699	-0.1851
Return on Assets	-0.2266	-0.6385	-0.4734
Market Book Value	-0.1298	-0.1418	-0.1305
Free Cash Flow	-0.3616	-0.7295*	-0.5619*
Firm Size	0.7536*	0.0809	0.0439

6.6. REITs management structures and Earnings Management: Multivariate OLS regression

The results of the OLS regression for testing the association between REITs management structures and Earnings Management are presented in Table 10. The dependent variable is estimated from the cross-sectional modified Jones (1991) model. The two proxies for management structures include a DUMMY variable for internally managed REITs as 1 and externally managed REITs as otherwise (0). Although Gras-Gil et al (2016) provided contrary evidence, we corroborate these findings with that of Arun et al (2015) wherein Firm SIZE is found to be negatively associated with the measure of earnings management. The negative FIRM SIZE coefficient term tells the change in Discretionary Accruals (DA) for a unit change in Firm Size i.e. if firm size rise by 1 unit, then earnings management decrease by -3.2 times. The results are significant at 10% level (α=-3.21, p=0.1), implying a negative relationship between FIRM SIZE and earnings management. While there is no agreement in the literature regarding the effect of FIRM SIZE on earnings management, these findings imply that aggressive earnings management practices is not dependent on a firm/REIT being large due to the close scrutiny by investors. Contrast to Alhadab & Al-Own (2017), Bhojraj et al. (2009) and Taylor & Xu (2010), we find that the positive RETURN ON ASSETS (ROA) coefficient term tells the change in discretionary accruals (DA) for a unit change in ROA i.e. if the ROA values rise by 1 unit, then earnings management increase by 4.4 times (α=4.4, p<0.05). The results are significant at 5% level, implying a significant relationship between ROA and earnings management.

With ROA being a measure of firm performance, these findings are consistent with extant studies (Lee et al., 2006; Dechowet et al., 1995; and El Sood, 2012); with these, it could be that REITs managers of internal and external management classifications use earnings management to understate the current period reported earnings in attempt to reduce the

current market price of the firm's common stock or adopt stock options plans that will ultimately increase share prices and consequently firm value (Alves, 2012). The negative market value coefficient term tells the change in Discretionary accruals (DA) for a unit change in market values i.e. if market values rise by 1 unit, then earnings management decrease by -2.34 (p=0.06). The results are significant at 10% level, implying weak evidence between market to book values and earnings management. Free Cash flow (contrast literature - Bukit, 2015; Nekhili, 2016; Astami, et al, 2017) – we perceive these findings are unique because REITs with high FCF situation and low growth opportunities are bound to result in low long term profitability. To conceal the impending bad performance of these new investments, corporate executives turn to negative accruals to reduce current year's earnings and smooth earnings when the negative effect of these investments occurs. Surprisingly, these results indicate that there were lower levels of earnings management in internally managed REITs compared to externally managed REITs; dividend yield, and debt equity ratios were also not significant predictors of earnings management.

We believe that there is no widespread or aggressive earnings management practice among South African internally managed REITs; yet, these findings are not consistent with the literature on the subject (Epps & Ismail, 2009; Xie et al., 2003; Beekes et al., 2004; Chen et al., 2007). We believe these findings are one-of-a-kind because of the rising popularity of REITs in South Africa and their reputation as an interesting investment option for investors in Africa, with a current market size of about $400 billion. In addition, these results are based on the fact that the administration of South African REITs is handled by organizations that adhere to stringent governance standards and are performance-driven and entrepreneurial (de Klerk, 2019; Moloi & Akinsomi, 2019). By implication, this suggests that they are focused on getting the most out of their property investments in the long term. They improve the real estate industry's transparency and accountability by implementing sound governance practices.

Table 10: Do internally managed REITs manage Earnings more than externally managed REITs: Multivariate OLS Regression

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]	Coef	Std.Err.	z	P>z	[95% Conf.	Interval]
Internally Managed REITs							Externally Managed REITs					
DA												
1.Internal	1.306	3.661	0.36	0.722	-5.88178	8.494011	2.113	2.892	0.51	0.521	-4.1134	7.71839
Firm Size	-3.213	1.665	-1.93	**0.054	-6.47721	0.051	-3.021	2.510	-1.71	**0.161	-5.02191	0.0021
MBVR	-2.342	1.243	-1.88	**0.06	-4.77939	0.09481	-3.910	1.031	-1.54	**0.75	-4.01831	0.071027
Dividend Yield	0.721	0.7182	1	0.315	-0.68629	2.129007	0.810	0.8210	1	0.741	-0.51089	1.920281
Debt/Equity_1	0.677	0.843	0.8	0.421	-0.97436	2.330233	0.319	0.310	0.65	0.682	-0.85105	2.829102
Return on Assets	4.499	1.835	2.45	*0.014	0.901663	8.096469	4.103	1.720	2.01	*0.003	0.75631	7.038293
Free Cash Flow_1	0.137	0.460	0.3	0.764	-0.76388	1.039834	0.201	0.501	0.41	0.620	-0.82184	1.070291
Constant	48.069	37.607	1.28	0.201	-25.639	121.7784	43.012	33.103	1.31	0.318	-23.019	117.0128

NOTE: R-squared= 0.9970; Prob > chi2= 0.0000. **Significant at 5% level *Significant at 10% level. Property, plant, and equipment (PPE) dropped due to collinearity

7.0. Conclusion

Earlier research that has documented large discretionary accruals accompanying seasoned stock issues has done so without taking the management structure of the issuing REITs into consideration. We propose that information asymmetry concerns are more severe in an externally managed REIT, and that as a result, earnings management is more aggressive in an externally managed REIT than in an internally managed REIT in the same industry. Using a sample of 34 South African real estate investment trusts (REITs) that issued seasoned equity between 2013 and 2020, we investigate the difference in discretionary accruals between internally and externally managed REITs in South Africa. When comparing externally managed REITs to internally managed REITs, we find that the former have higher discretionary accrual amounts; even after adjusting for elements that have been demonstrated to be associated with a firm's Discretionary Accrual, these findings are not consistent across the commonly used measures of earnings management. In this study, it is hypothesized that the composition of a REIT's board with external directors has an influence on the practice of earnings management in South Africa (Marrakchi Chtourou, et al., 2001; Shah, et al., 2009; Uadiale, 2012; Abbadi, et al., 2016). SEOs are the subject of this investigation, which demonstrates how accrual management may be utilized to achieve financial objectives. In order to "achieve the objectives," it is standard practice to manipulate earnings in order to increase profits. Previous research have reached varying conclusions in a variety of settings. Accruals decline with external management, but there is no statistically significant effect of external management on earnings manipulation, as Kim & Yoon (2008a) and Mazumder (2016) demonstrate. Additionally, scholars assert that externally managed firms, particularly those with a high and stable proportion of foreign capital in their capital structure, engage in less profits management than internally managed firms (Mohd-Sanusi, & Hermawan, 2017 and Guo et al., 2015).

Shayan-Nia et al. (2017) stated specifically that they can limit upward earnings management owing to discretionary expenditure but not due to the work cycle. According to Guo et al. (2015), firms with external management also lower earnings manipulation, but through net cash in firms listed in Japan. On the other hand, Udawatte (2020) cites the information asymmetry between domestic and foreign investors as one reason why managers in firms are more inclined to manage earnings. For the first time in South Africa, we find evidence that financial sheet manipulation is associated with the extent of external management of REITs, indicating that the REITs board of directors does not benefit significantly from external

directors in monitoring the firm's management of earnings, which is consistent with Park & Shin (2004). According to a few reasonable variables, external management of real estate investment trusts (REITs) is inefficient in regulating earnings management in South Africa throughout SEO period. Due to a lack of financial acumen and access to critical information, external directors may be unable to identify and correct earnings management in the majority of cases. External directors may also be disinterested directors as a result of their lack of financial interest in the firm over which they preside. In addition, if there are a large number of powerful shareholder CEOs, it may be difficult for CEOs to properly oversee earnings management.

In addition to having a number of practical implications, this research should be of particular interest to the relevant securities exchange regulatory body in South Africa, which is currently engaged in an anti-earnings management campaign, and the Accounting Standards Board (ASB), which has proposed changes to its standards setting process in order to shift away from a rules-based approach to principles-based standards setting. The study's findings imply that good corporate governance is a critical safeguard for stakeholders in exceptional circumstances when REITs have special incentives to manage earnings; as a result, it is suggested that REIT corporate governance is important, despite being overlooked in some circumstances. It is possible that reducing accounting discretion may increase the informativeness of earnings since it will confine earnings management and encourage the comparability of outcomes among REITs (Fishman & Hagerty 1990). Specific to South African real estate investment trusts, policymakers as well as nominating committees of the board of directors may wish to take note that financial competence is an important quality of external directors in order to effectively oversee earnings management. Future studies could include alternative measures of earnings management (beyond total accruals, as used in this study).7.0

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SOUTH AFRICAN REITS PREFER THURSDAYS AND FRIDAYS

Ajayi Oluwaseun Damilola, Gavu Kofi Emmanuel and Iheanacho Munachi

Abstract

Purpose: The paper examined the presence of day-of-the-week effect on returns of different classifications of South African REITs.

Methodology: The ordinary least square regression (OLS), generalized autoregressive conditional heteroskedasticity (GARCH) (1,1) (2,1) and Kruskal-Wallis (KW) test were utilized on data obtained from the IRESS Expert database from 2013 till 2021.

Findings: The best day to invest in office, diversified and industrial REITs was Friday, Thursday and Friday respectively. Wednesday was found to be the least profitable day as it had the least average daily return while Tuesday was the most profitable day with the highest average daily return. REITs were traded the most on Friday while REITs were least traded on Monday. Returns were most volatile on Monday while volume was least volatile on Thursday. The KW test revealed a statistically significant difference between the median returns across the days of the week. Based on findings, the best day to invest in office REITs is Friday, diversified REITs (Thursday), and industrial REITs, Friday.

Practical Implications: By recognizing the day-of-the-week effect, investors can buy/sell South African REITs more effectively.

Originality: This paper apart from being the first in the context of South African REITs, brings updated evidence of the contested calendar anomalies issues.

Keywords: day-of-the-week effect, efficient market hypothesis, market liquidity, Kruskal Wallis, GARCH, REITs

Paper type: Research paper

1.0. Introduction

The efficient market hypothesis of Fama (1970) assumes that prices of security reveal all available information that market participants require to make an investment. Thus investors assume that return on security shall be consistent. However, empirical inquiries show several anomalous patterns in stock prices and returns such as equity premium, size effect, overreaction, discount on close-end funds, day-of-the-week effect, among others. One of such abnormality in returns is the day-of-the-week effect, where returns on a given day vary from other days of the week. Cross (1973) observes that opening of markets after week-ends are fairly unattractive in term of returns. It means that the first day-of-the-week, Monday, generates the least returns. The differential in returns on different days of a week prompt more inquiries, which observe variation in days with maximum and minimum returns on a given day of a week. Thus, the term Day-of-the-week effect, weekend effect, Monday effect and Tuesday effect are coined to test the differences in stock returns on the given days (Mazviona, et al., 2022; Khan, et al., 2021; Obalade & Muzindutsi, 2019; Berument & Kiymaz, 2001). Recent literature indicates that the day-of-the-week effect is inconclusive - diminished or disappeared. Some evidence from developed market is established in this regard. Olson, Mossman, and Chou (2015) claim that such effects have been declining since 1970s and it cannot be traced from long-term data. Similarly, Trick (2018) finds a moderate day-of-the-week effect in few sectors in the United States, but claims that the overall market does not exhibit the day-of-the-week effect. Additionally, Abrahamsson and Creutz (2018) show that the OMXS30 index shows no day-of-the-week effect. Furthermore, Rossi and Gunardi (2018) find no weekend effect in developed European markets that is, France, Germany, Spain and Italy. However, Miss, Charifzadeh, and Herberger (2020) show persistent Monday effect in Germany. Birru (2018) finds a day-of-the-week effect on speculative stocks but no such effects are revealed from non-speculative stocks. He also claims that the day-of-the-week effect does not exist after 1975. Similarly, Chiah and Zhong (2019) show that investment in speculative stocks surge on Friday, which results in day of the week effect in the markets.

Interestingly, the day-of-the-week effect is more prominent in frontier and emerging markets. Gbeda and Peprah (2018) explore the day-of-the-week effect in Nairobi Stock Exchange, Adaramola and Adekanmbi (2020) find the day-of-the-week effect in Nigeria. Akbalik and Ozkan (2017) assesses the day-of-the-week effect in Indonesia. Furthermore, Paital and Panda (2018) approve the existence of the day-of-the-week effect in India that is in contrast with the findings of Akbalik and Ozkan (2017). Likewise, Chancharat, Maporn, Phuensane,

and Chancharat (2018) discover anomalies in market returns in Thailand. While, Islam and Sultana (2015) observe the day-of-the-week effect in Bangladesh. Recently, Singh, Bhattacharjee, and Kumar (2020) discover higher returns in emerging markets of China, India and Brazil at the turn of month that is significantly different than other days of months. The theory associates days of the week effect with market inefficiency (Islam & Sultana, 2015; Birru, 2018; Abrahamsson & Creutz, 2018; Paital & Panda, 2018; Miss, Charifzadeh, and Herberger, 2020). Thus, the existence of day-of-the-week effect rejects the efficient market hypothesis. Although some evidence from developed markets suggests that it has disappeared over time. However, few studies affirm it exists specifically in less established markets. Interestingly day-of-the-week effect is not consistent across markets and time. Furthermore, returns from an exchange are used to capture the day-of-the-week effect. Conversely, stock liquidity is an important indicator for understanding investor behaviour that is not widely considered for the testing day-of-the-week effect. Stock liquidity is a condition where stock is traded easily with-out affecting its price. It is a positive feature that investors seek when making an investment decision.

The draining of liquidity from markets has been associated with crises and chaos. In almost each stock market crisis, (e.g. 1987, 1998 and 2008) flight of liquidity from the market has been observed. Building from the above premises, this study investigates the day-of-the-week effect in an Emerging Market as recommended by Akbalik & Ozkan, (2017) and Rossi & Gunardi (2018). Kim and Nofsinger (2008) emphasize that the uniqueness and size of emerging markets, make it important to inquire about financial behaviour in emerging markets. These markets have unique political and economic dynamics. Considering the sensitivity of the day-of-the-week effect, three approaches that is, ordinary least square (OLS), generalized autoregressive conditional heteroscedasticity (GARCH) (1, 1) and Kruskal-Wallis test are used for analysis. The findings within this paper reveal the day-of-the-week effect in return in South Africa. Moreover, the evidence for the day-of-the-week effect in returns is significant in South Africa. Interestingly, the highest and the lowest returns observed in different market classifications vary. In office, diversified and industrial REITs, Friday, Thursday and Friday are the best days to invest respectively; Wednesdays generate the lowest returns. REITs were traded the most on Friday while REITs were least traded on Monday. Returns were most volatile on Monday while volume was least volatile on Thursday. The results are identical to the findings of the recent literature that show variation in the day-of-the-week effect.

2.0. Literature Review

2.1. The Day-of-the-Week Effect in REITs

REIT returns have been studied by researchers to see whether any irregularities can be found (Mazviona, Mah & Choga, 2022; Letdin, Sirmans, Sirmans & Zietz, 2019). In the first stage of the day-of-the-week effect study, Redman, Manakyan, and Liano (1997) studied the returns on REITs. The January effect, the turn of the month effect, the day of the week effect, and the pre-holiday effect were found to exist in REITs by these prior studies. Swint & Eric (2000) discovered that findings for stock REITs demonstrated that, like equities securities, returns on Monday were positive when returns on Friday were positive, and returns on Monday were negative when returns on Friday were negative; this is corroborated by recent studies (Fettouhi & Kifani, 2022; Letdin, et al., 2019). This was not the case with Malaysian REITs (MREITs); however, all REIT categories were found to have a strong first-order autocorrelation trend throughout the weekend. When it comes to the REITs market, the removal of lower and negative returns on Mondays corresponded with an increase in the number of investors in the REITs market. To put it another way, in the case of US REITS, there was no Monday abnormality observed. Hardin, Liano and Huang (2005) discovered that every trading day had positive returns but that they were only substantial on Friday (Connors, Jackman, Lamb and Rosenberg, 2002). These fascinating findings echo those of Chan, Leung, and Wang (2005) and reignite interest in the anomaly related to the day of the week. It was observed that REITs returns on Thursday and Friday were considerably positive, while Monday returns were insignificantly positive in the U.S. REITs market from 1997 to 2007 when Brounen and Ben-Hamo (2009) investigated the pattern of returns around the weekend. Prior academic research has been mostly inconclusive on the influence of REITs on the weekday effect. The day-of-the-week influence on SA REITs is thus examined.

2.2. Market liquidity

Market efficiency prevents anomalous market behavior, and liquidity is a sign of market efficiency. Liquidity, according to Chordia, Roll, and Subrahmanyam (2008), increases market efficiency primarily by allowing arbitrage. Market liquidity has been linked to returns, efficiency, and the psychology of investors, according to a number of studies; this might lead to a weekday effect. Stock liquidity influences stock returns, according Li & Luo (2019). Aside from that, the rush for liquidity has psychological consequences and encourages a herd mentality. According to Chordia et al. (2008), the existence of arbitrage is filled by orders and

liquidity in a market. Li & Luo (2019) make the assumption that returns are favorably affected by liquidity. Liquid equities are less volatile in the event of a liquidity flight and stock market crisis. Switching from less liquid equities to more liquid ones affects liquidity flight. It has been shown that the focused buying behavior is influenced by the flow of information, uncertainty, liquidity, and fluctuations in oil prices. Market liquidity is related with a market with a significant number of international traders and corporate mergers. As a result, a market with more players and money would be more liquid and efficient. Boubaker et al. (2017) found that stock market liquidity is influenced by investor attitudes. Foreign investors see a greater impact. Birru (2018) found no correlation between the day-of-the-week impact and stock liquidity, contrary to the findings of Huang et al. (2010). To eliminate market inefficiency, a hypothesis suggests that liquidity is critical. Thus, the notion that the day of the week affects liquidity is examined. We develop our hypothesis as follows:

H0: Market liquidity does not differ on different days of the week in the REITs market of South Africa
H1: Market liquidity does differ on different days of the week in the REITs market of South Africa

2.3. South African REITs

Das (2016) defines an emerging economy as one with high short-term output and financial and economic volatility. Brazil, Russia, India, and China (BRIC) formed a diplomatic-political bloc in 2006. South Africa joined in 2011, and the acronym became BRICS. The BRICS group was created because its economies are expected to grow rapidly (Anuoluwapo, Abdul-Wasi, and Edwin, 2018). Since its establishment, the BRICS members have increased their involvement in international markets, demonstrating the group's growing influence and visibility (Huidrom, Kose, & Ohnsorge, 2016). Emerging markets are likely to grow quickly in the next years, making them appealing to foreign and domestic investors. The development of Real Estate Investment Trusts (REITs) has allowed investors to diversify their portfolios by investing in emerging nations' property markets. Several studies have explored REITs in emerging economies (Kanaryan, Chuknyisky, & Kasarova, 2015). Adding real estate to a portfolio may boost overall performance, provide alternatives to direct-asset investing, and help investors avoid liquidity issues (Aktan & Ozturk, 2009). South Africa is presently a growing market for REITs due to its 2011 BRICs membership and 2013 REIT structure implementation, according to Akinsomi et al (2016). PLS and PUT were the only publicly traded property investment businesses in South Africa before 2013. (PUT). PLS and PUT are REITs. South Africa launched REITs in 2013 to replace PLSs and PUTs. PUTs and PLS double-taxed investors years ago. South Africa adopted the REIT structure, transforming existing PLS into firm REITs and PUTs into trust REITs. PUTs and PLS are not recognized globally and do not

attract international investment; these two firms are subject to different rules and legislation despite dealing in property shares, and PLS's perplexing tax concerns spurred their conversion into REITS (Anuoluwapo, et al, 2018). REITs should address these challenges in South Africa. REITs are easy to understand and similar to foreign tax arrangements, making them attractive to worldwide investors (Anuoluwapo, et al, 2018). This structure makes it easy to compare SA REITs to others worldwide. After REITs were created in South Africa in 2013, a substantial majority of JSE-listed REITs sought registration. REITs' flexibility and tax certainty trumped PUTs and PLSs (Anuoluwapo, et al, 2018).

REITs are tax designations for real estate investors. Equity REITs hold income-producing assets; mortgage REITs invest in residential or commercial mortgages; and hybrid REITs do both. REITs are examined because of their distinct structure compared to regular stocks. REITs must have at least 75% of their assets invested in real estate, receive 75% of their gross revenue from rentals or mortgage interest, and pay 90% of their taxable income in dividends, according to the SEC. The National Association of Real Estate Investment Trusts (NAREITS) said the industry's dividend rates have traditionally delivered a continuous stream of revenue in a range of market circumstances. REITs have attractive financial structures because they can access corporate financing and equity. Less capitalized proprietors can't afford tenant improvements and leasing commissions. Size and maturity of the sector may also affect REIT outcomes against the general stock market. According to NAREITS, REITs have grown rapidly since the early 1990s, after being founded by Congress in 1960. Cotter and Stevenson (2006) observe in their study of REIT volatility that the sector's recent rise has changed its dynamics. Despite tremendous development, the industry is still dominated by small and mid-cap enterprises with an average size of $2bn. Literature suggests that macroeconomic variables that explain stock and bond returns also explain REIT monthly and quarterly returns and risks (Clayton & MacKinnon, 2003; Loo, et al., 2016). REITs are a combination of stocks and bonds in risk exposure, with little or no role for physical real estate in pricing. Recent discussion has focused on REIT returns and hazards. The significant rise and maturity of REITs since 1992 led to accusations that the relationship between REITs pricing and real estate market fundamentals had gotten stronger, making REITs "more like real estate and less like stock" (Clayton & MacKinnon, 2003). The key evidence for this assertion is the decreasing connection between NAREITS and S&P 500 returns and the inadequacy of stock and bond components to explain REITs returns during the early 1990s "REITs boom" (Oikarinen, et al., 2011; Block, 2011; Jackson, 2009; Chang, et al., 2011). Laopodis (2009) observed that equity and mortgage REITs had similar stock market interactions.

Allen et al. (2000) propose that while REITs may not be able to totally isolate their performance from external factors, they may be able to modify their exposure to macroeconomic variables to impact their market risk. Although their model suggests equity and non-equity REITs may differ in market-risk sensitivity, no data suggests that asset allocation (equity versus mortgage) influences a REIT's exposure to stock-market or interest-rate fluctuations. Gyourko & Nelling (1996) studied REIT systemic risk; the paper estimated asset and equity betas and then utilize them as the dependent variable in regressions using property-type composition and size as independent variables. Allen et al (2000) show that REITs' diversification and interest rate and market betas vary. Idiosyncratic risk doesn't play a big part in CAPM's explanation of cross-sectional stock returns; this is corroborated by Fama & MacBeth (1973). Newer research show conflicting findings. Malkiel and Xu (2006) find a slightly significant relationship between idiosyncratic risk and predicted stock returns. Fu (2009) shows a higher positive relationship between idiosyncratic volatility and GARCH. It is also shown that Goyal and Santa-Clara (2003) show a positive correlation between stock returns and idiosyncratic stock variation. The positive correlation is in line with the claims made by Merton (1987) and Malkiel and Xu (2006) that idiosyncratic risk can be priced in a world where investors choose to keep under-diversified portfolios or are forced to do so. CAPM was developed by Sharpe (1964) and the GARCH model are used to evaluate the relative specificity of REIT returns. As in Bomfim (2003), we utilize the GARCH model. As independent variables in these models, we use the market index as a measure of the relative riskiness of real estate, and as dummy variables, the days of the week. There is evidence that negative shocks (or "bad news") in the market have a greater influence on volatility than positive shocks (or "good news") of the same size in the stock market.

Studying the returns of various categories of South African REITs simultaneously would enable us to draw inferences for REITs. Investors and portfolio managers would be interested in learning how sensitive returns, and volatility of these categories (REITs) are to stock market movements in order to improve the risk management of their portfolios and whether they should be used for portfolio diversification. The examination of REITs return behavior based on a time-variant model like GARCH is up-to-date after the evolution of the REITs regime in South Africa (2013). The analysis reaches up to 2021 and is useful to see how SA REITs perform in a turbulent market environment. The remainder of this paper is structured as follows. Section 2 presents preliminary statistical issues and prior empirical findings; in Section 3, the data and methodological approach of the study and the data set are discussed. In Section 4, the paper presents and discusses the results while the paper concludes with Section 5.

3.0. Data and methodology

We use daily data from the IRESS Expert database from 2013 till 2021. A potential issue with the use of daily data is that it may mask the exact impact and help us understand the day of the week effect. Cotter and Stevenson (2006) also identify that the broad market would appear to be more influential in the daily case. The paper seeks to establish whether there exists the day-of-the-week effect in both return and volatility for the different categories of South African REITs. Some of the variables and terms used in the methodology include:

Returns (%) – The data used was the daily stock price data for Office, Industrial, Residential, Diversified and storage REITs over the period January 2013 to December 2021. The return was computed as a percentage and based on the closing stock prices computed as follows: Daily Return = (Close/open – 1) * 100

Volume – The volume measured how a given financial asset was traded in a given period of time; and useful in determining the liquidity of the REITs. The higher the volume, the more the REITs was traded.

EY – earnings yield – The earnings yield was used to show how much earnings are earned for every dollar invested in the company. The higher the EY, the better is the performance of the asset. The EY is computed by getting the Earnings per share are divided by the stock price per share. i.e., Earnings Yield = Earnings per Share / Stock Price Per Share*100

PE – price to earnings ratio – The PE used in the paper represents the value of the asset obtained by measuring the current share price relative to the earnings per share (EPS). Higher PE ratios indicate that higher price was paid thereby making the stock expensive. The PE is given by: market value per share/earnings per share

The paper employed 6 major tests in Table 1 with a view to examining the day-of-the-week effect on returns of different classifications of South African REITs. These tests are provided in the table below:

Table 1: Categories of Tests

	Test	Method
1.	Normality tests	• Q-Q plot • Histogram
2.	Constant variance	• Brown-Forsythe Test (BF) test Statistics
3.	Stationarity and trends	• Dicky-Fuller test
4.	Heteroskedasticity (Autocorrelation)	• Ljung-Box Q test
5.	Constant conditional variance	• Generalized Autoregressive Conditional Heteroskedastic test (GARCH)
6.	Day of the week effect	• Kruskal Wallis Test

Boubaker et al. (2017) argue that the GARCH (1,1) is the most efficient technique of GARCH family, hence different models including OLS, GARCH(2,1) and Kruskal-Wallis tests were explored and employed in testing the day-of-week effect in the research study. The OLS and GARCH (2,1) were implemented using SAS statistical software. Prior studies presents that the seasonal anomalies are better estimated with such models that capture volatility in time series data (Abrahamsson & Creutz, 2018; Chancharat et al., 2018; Rossi & Gunardi, 2018; Trick, 2018). Boubaker et al. (2017) argue that the day-of-the-week effect with the latest data and better techniques has either vanished or transferred to different days as suggested by previous studies. Therefore, simple OLS and MANOVA do not account for autocorrelation and heteroscedasticity, so results could be spurious. Similarly, Berument and Kiymaz (2001) claim that the time series data are subject to variation across time that makes simple OLS inefficient to predict results. Recently, Richards and Willows (2019), Miss, Charifzadeh, and Herberger (2020), Anjum (2020), and Li et al (2022) incorporated GARCH and variants of GARCH to test day-of-the-week effect in time series data. Thus, to account for heteroscedasticity, generalized autoregressive conditional heteroscedasticity (GARCH) is employed. Engle (1982) suggests a model (Autoregressive Conditional Heteroskedastic Models (ARCH)) that allows the forecast variance of return equation to vary systematically over time. The OLS model to test for the day-of-the-week effect was given by the following equation:

$$Rt = \beta 0 + \beta 1D1 + \beta 2D2 + \beta 3D3 + \beta 4D4 + et \qquad \text{(Eq.1)}$$

Where;

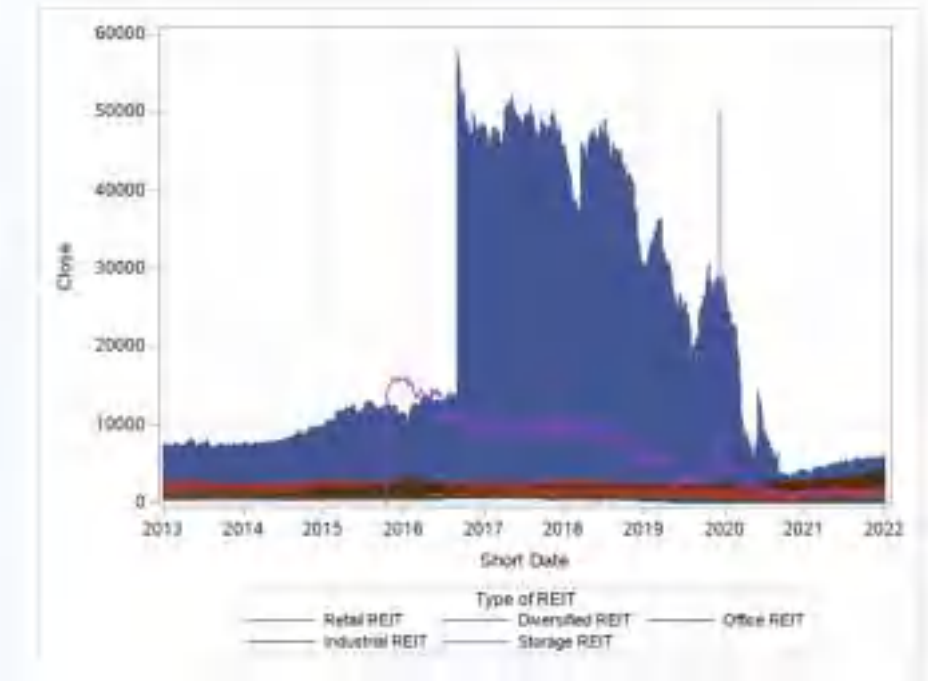
- Friday is the reference category (base period)
- D1, D2, D3, D4 were the dummies for Monday, Tuesday, Wednesday and Thursday.
- β1, β2, β3, β4 were the coefficients (slope) of the dummy variables for the days of the week (Monday, Tuesday, Wednesday and Thursday).
- The equation assumed that returns and volume traded are the same for each day-of-the-week where $\beta 1 = \beta 2 = \beta 3 = \beta 4$

4.0. Results

4.1. Time series plot of closing price for different REITs (2013 – 2021).

From the plot in Figure 1, it can be seen that the closing prices of different daily prices has been varying during the years with highs and lows especially during the years 2014, 2018 and 2020.

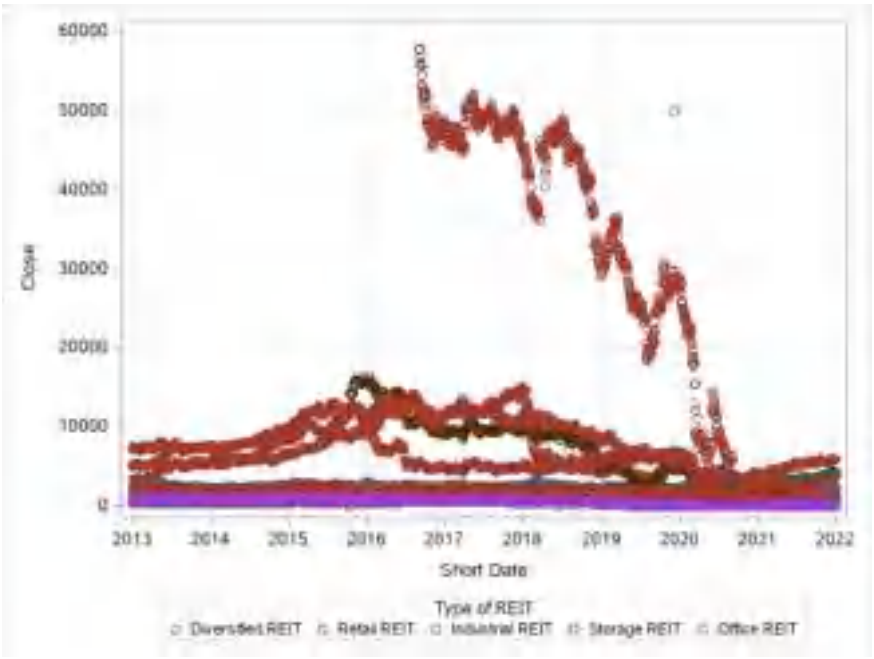
Figure 1: Time series plot of closing price for different REITs (2013 – 2021)



4.2. Scatter plot of closing price for different REITs (2013 – 2021).

From the scatterplot in Figure 2, it can be seen that the closing prices of different daily prices has been varying during the years with highs and lows especially during the years 2014, 2018, 2019 and 2020.

Figure 2: Scatter plot of closing price for different REITs (2013 – 2021).



4.3. Summary Statistics

4.3.1. Summary Statistics (Average Return, Earnings Yield and PE Ratio)

Table 2 shows the return (%) and volume of the different REITs in the market over the 9 year period (2013-2021). A total of 57228 observations from 11 indexes was analyzed. The analysis table shows that the South African REITs market generated an average daily return of 0.0121 percent and a mean daily volume of 1626514.94. Also, the table shows that the South African REITs market generated 5.5443 percent mean daily earning yield and an average daily PE of 22.4673 over the period 2013 – 2021.

Table 2: Summary Statistics (Average Return, Earnings Yield and PE Ratio)

Variable	Mean	Std Dev	Min	Max	N	Std Error	Skewness	Kurtosis
Average Return (%) and Volume for all entire sample								
Return (%)	0.0121	4.4262	-89	762	57228	0.0185	92.1907	15492.4300
Volume	1626514.94	5131165.79	0	492463851	57228	21449.230	25.4329	1759.4300
Earning yields and PE ratio								
Return (%)	5.5443	70.3366	-2093.6700	320.2300	57228	0.2940	-26.0806	774.5832
Volume	22.4673	272.9704	-560.8100	17533.190	57228	1.1411	47.5425	2833.5300

4.3.2. Summary Statistics: REITs Return and Volume based on days of the week

In Table 3, it can be seen that Wednesday was the least profitable day as it had the least average daily return (-0.0187%) while Tuesday was the most profitable day with the highest average daily return (0.0429 %). REITs were traded the most on Friday (1801853.92) while REITs were least trade on Monday (1389464.8600). Returns were most volatile on Monday with a Std Dev of 7.9000 and variance of 62.4105 while volume was least volatile on Thursday with a Std Dev of 2.6652 and variance of 7.1032

Table 3: Summary Statistics for all REITs based on days of the week

Day	Observations	Variable	Mean	Std Dev	Min.	Max.	Std Error	Skewness	Kurtosis
Monday	11082	Return (%)	-0.0123	7.9000	-89	762	0.075	81.0119	7818.0300
		Volume	1389464.8600	3593805.4200	0	83319284	34138.580	7.3278	89.6421
Tuesday	11597	Return (%)	0.0429	2.9210	-87	48	0.027	-1.2452	102.5695
		Volume	1578729.8100	4167828.8400	0	86678406	38702.320	7.4641	88.1477
Wednesday	11528	Return (%)	-0.0187	3.2110	-29	158	0.030	16.2021	740.8463
		Volume	1612124.1100	4498011.0400	0	1.93E+08	41893.200	11.9821	336.9375
Thursday	11641	Return (%)	0.0216	2.6652	-66	42	0.025	-0.2840	60.3537
		Volume	1742629.7800	4888096.5000	0	1.19E+08	45304.840	7.6865	92.8028
Friday	11380	Return (%)	0.0260	3.3680	-61	209	0.032	21.2601	1326.2400
		Volume	1801853.9200	7556100.1900	0	4.92E+08	70831.520	33.2659	1805.9800

4.3.3. Summary Statistics: REITs Earnings Yield and P.E Ratio based on days of the week

Thursday was found to be the least profitable day as it had had the least average earning yield (5.4096) while Tuesday was the most profitable day with the highest earning yield of 5.7679. Monday had the highest P/E ratio (24.2802) while Tuesday had the least P/E ratio (22.6331). The EY was most volatile on Monday with a Std Dev of 313.2937 and variance of 98152.93 while P/E was least volatile on Friday with a Std Dev of 257.6273 and variance of 66371.81.

Table 4: Summary Statistics: REITs Earnings Yield and P.E Ratio based on days of the week

Day	Observations	Variable	Mean	Std Dev	Min.	Max.	Std Error	Kurtosis
Monday	11082	EY	5.4731	70.8509	-2093.6700	320.2300	0.6730	763.4039
		P.E	24.2802	313.2937	-557.4000	17467.1000	2.9761	2313.3600
Tuesday	11597	EY	5.7679	66.7071	-2093.6700	320.2300	0.6194	844.9525
		P.E	22.6331	268.2286	-560.8100	17533.1900	2.4908	2989.8700
Wednesday	11528	EY	5.4304	72.1779	-2093.6700	320.2300	0.6722	743.0117
		P.E	21.9775	264.0823	-555.8900	17278.2700	2.4596	3016.8700
Thursday	11641	EY	5.4096	71.8917	-2093.6700	320.2300	0.6663	747.6089
		P.E	21.7764	259.3673	-550.1700	16730.6500	2.4039	2974.1400
Friday	11380	EY	5.6390	69.9497	-2093.6700	320.2300	0.6557	782.7913
		P.E	21.7359	257.6273	-550.4700	16910.0400	2.4150	2960.3800

4.3.4. Summary Statistics: REITs Average Return and Volume based on days of the week

In Table 5, we document that the REIT with the highest average daily return is the Industrial REITs (0.0683%) while the REITs with the least average daily return is the office REITs (-0.0455%). The REITs that was traded the most was diversified REITs with an average volume of 3140941.36) while the least traded REITs was the storage REITs with an average volume of 176980.12. In terms of the average returns (%), Retail REITs appears to be the riskiest with a Std Dev of 2.8784 while in terms of volume, the diversified REITS had the highest variance (std=7597739.78 and variance=5.7726E13) while the industrial REITS had the least variance (std=1.9699 and variance=3.8807).

Table 5: Summary statistics: REITs Average Return and Volume based on days of the week

Type of REITs	Observations	Variable	Mean	Std Dev	Min.	Max.	Std Error	Kurtosis
Diversified REITS	22612	Return (%)	0.0144	2.5947	-62	158	0.0173	759.3137
		Volume	3140941.3600	7597739.7800	0	4.92E+08	50526	890.8934
Industrial REITS	4056	Return (%)	0.0683	1.9699	-15	50	0.0309	110.5480
		Volume	371343.6700	856167.8300	0	26141619	13443.4300	238.9553
Office REITS	6747	Return (%)	-0.0455	3.4704	-32	47	0.0422	21.9167
		Volume	569664.4100	1282191.0700	0	28274669	15609.8000	125.3574
Retail REITS	22255	Return (%)	-0.0169	2.8784	-89	48	0.0193	63.8529
		Volume	738431.8200	2107155.7500	0	1.93E+08	14124.8200	3382.1700
Storage REITS	1558	Return (%)	0.4955	21.0078	-87	762	0.5322	1117.6200
		Volume	176980.1200	1133893.2700	0	32477103	28726.8800	511.2554

4.3.5. Summary Statistics: REITs Average Earnings Yield and P.E Ratio based on days of the week

In Table 6, the REITs with the highest average daily EY is Office REITs (20.8748) while the REITs with the least average daily EY is Industrial REITs (-17.1661). The REITs with the highest average daily P/E is Retail REITs (37.3489) while the REITs with the least average daily P/E is Office REITs (9.5427). In terms of EY, Industrial REITs appears to be the riskiest with a Std Dev of 248.9739 and while in terms of PE, Retail REITs had the highest Std Dev of 37.3489.

Table 6: REITs Average Earnings Yield and P.E Ratio based on days of the week

REITs	Observations	Variable	Mean	Std Dev	Min.	Max.	Std Error	Kurtosis
Diversified	22612	EY	7.9204	7.2954	-24.6000	45.7000	0.0485	4.0780
REITS		P.E	14.0460	71.1005	-178.4000	1095.2400	0.4728	142.0589
Industrial REITS	4056	EY	-17.1661	248.9739	-2093.6700	320.2300	3.9094	63.9730
		P.E	13.4070	14.0971	-68.3000	62.0300	0.2214	12.4898
Office REITS	6747	EY	20.8748	27.0309	-37.2900	181.3700	0.3291	5.6458
		P.E	9.5427	26.4100	-35.9600	262.4700	0.3215	45.0419
Retail REITS	22255	EY	3.2451	28.4203	-319.6000	62.7700	0.1905	43.1037
		P.E	37.3489	431.1104	-560.8100	17533.1900	2.8898	1165.2500
Storage REITS	1558	EY	-3.3653	48.0852	-234.9400	72.6100	1.2182	10.0948
		P.E	11.6731	8.5822	- 0.9900	90.4900	0.2174	3.3036

4.3.6. Summary statistics of Return (%), Volume, EY, PY in different Years

In Table 7, the most profitable year was 2021with an average daily return of 0.1603 percent while the least profitable year was 2020 (-0.0816). The REITs were most traded in 2020 (2669951.7000) and least traded in 2014 (1013449.7900). EY was highest in 2020 (11.8206) and least in 2013 (-16.9165) while for P/E was highest in 2015 (84.2706) and least in 2020 (2.4989).

Table 7: REITs Return (%), Volume, EY, PY in different Years

Year	Observations	Variable	Mean	Std Dev	Min	Max	Std Error	Kurtosis
2013	4485	Return %	0.0299	1.6951	-16.0000	23.0000	0.0253	18.8761
		Volume	1046297.8800	2476056.6500	0.0000	45549435	36972.5500	73.7371
		EY	-16.9165	235.4232	-2093.6700	320.2300	3.5153	72.7613
		P.E	61.5161	836.6757	-174.5300	17533.1900	12.4933	401.1882
2014	5300	Return %	0.0692	1.5865	-13.0000	50.0000	0.0218	197.9675
		Volume	1013449.7900	2291638.9700	0.0000	53118026	31478.0800	76.5018
		EY	9.1957	22.7045	-0.9700	320.2300	0.3119	176.6636
		P.E	15.3154	44.2820	-178.4000	198.0700	0.6083	8.0747
2015	5367	Return %	0.0224	2.4796	-61.0000	104.0000	0.0338	646.7642
		Volume	1501224.5200	4233050.3100	0.0000	130729944.00	57781.3400	242.3107
		EY	8.0359	4.5835	-1.8600	26.9800	0.0626	2.7725
		P.E	84.2706	374.0513	-68.3000	2891.4800	5.1058	37.4084
2016	6185	Return %	-0.0128	2.0154	-18.0000	22.0000	0.0256	11.5836
		Volume	1509709.4500	3425512.8200	0.0000	59465913.0000	43556.7800	41.7692
		EY	7.7729	5.3042	-2.1300	45.2300	0.0674	13.6281
		P.E	33.6564	209.1412	-324.9100	2790.8900	2.6593	103.5825
2017	6972	Return %	-0.0043	1.4343	-20.0000	17.0000	0.0172	13.5687
		Volume	1512526.3100	3697517.7000	0.0000	71014834.0000	44282.4400	72.1369
		EY	7.6777	6.1034	-7.9000	48.8500	0.0731	10.5049
		P.E	6.8395	75.6349	-560.8100	220.4200	0.9058	30.8038
2018	7140	Return %	-0.0720	2.8215	-62.0000	158.0000	0.0334	1415.050
		Volume	1746105.9600	4978443.2100	0.0000	233058082.000	58917.5200	676.9112
		EY	7.7014	7.8294	-38.5500	35.3000	0.0927	12.5793
		P.E	15.0531	15.9324	-43.2700	94.6800	0.1886	10.5717
2019	7221	Return %	0.0179	9.4339	-87.0000	762.0000	0.1110	5897.950
		Volume	1519085.9900	3658489.8800	0.0000	49410027	43052.9800	39.5889
		EY	8.6596	20.9801	-143.9200	146.3200	0.2469	13.5596
		P.E	9.7112	14.6631	-67.7900	101.5800	0.1726	17.5094
2020	7308	Return %	-0.0816	5.9375	-89.0000	209.0000	0.0695	255.3871
		Volume	2669951.7000	9999916.4400	0.0000	492463851	116976.090	875.0750
		EY	11.8206	38.9949	-239.7000	181.3700	0.4562	14.0340
		P.E	2.4989	25.0211	-175.6700	41.8500	0.2927	24.2503
2021	7250	Return %	0.1603	2.9987	-21.0000	35.0000	0.0352	11.6279
		Volume	1673073.8000	4859730.7900	0.0000	192956423	57074.6400	373.5212
		EY	-0.5813	43.1500	-319.6000	72.6300	0.5068	18.3024
		P.E	3.4056	34.3414	-216.4300	82.4100	0.4033	11.5270

4.3.7. Statistical Tests

4.3.7.1. Testing for Normality for all REITs samples (2013-2021)

To test for normality of the closing prices of the REITs, the Q-Q plot and histogram in Figures 3 and 4 are used. The P-P Plot (Q-Q plot) for the closing prices shows that the data is non-normally distributed given that it does not align to the diagonal. It can be concluded that the closing prices of the REITs is non-normally distributed as confirmed by the histogram below which shows presence of outliers in the data which is skewed to the right.

Figure 3: Cumulative Distribution of Close

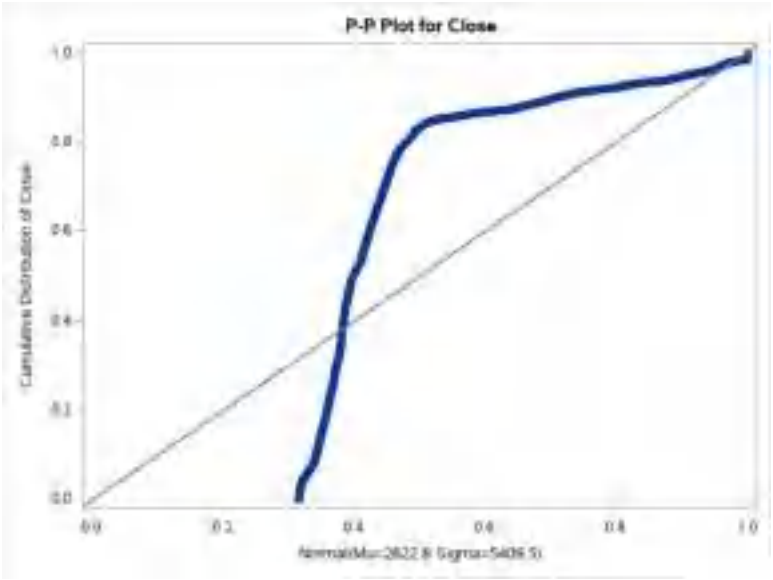
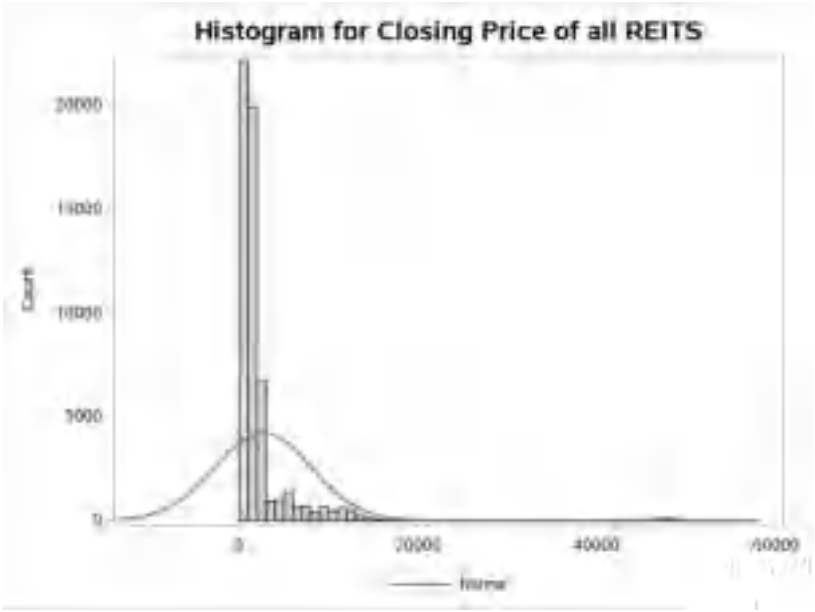


Figure 4: Closing Price for all REITs



4.3.7.2. Test for Constant Variance using Brown-Forsythe Test

To test for homogeneity of variance, the Brown-Forsythe test was used. One of the assumptions in ANOVA is the assumption that treatment variance is equal. Existence of moderate deviations from this does not seriously affect the results. However, ANOVA is only robust to small deviations from the homogeneity of variance assumption and hence cannot be used since the main interest is existence of large deviations. Considering Bartlett, levene and Brown-Forsythe test for non-normal data, the fail to choose Bartlett since it is sensitive (not robust) to non-normality. The Brown-Forsythe test is most preferred because it is not very sensitive to departures from normality.

Table 8: Brown and Forsythe's (BF) Test for Homogeneity of Return (%) Variance ANOVA of Absolute Deviations from Group Medians I

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Day	4	218.4000	54.5891	3.1200	0.0141
Error	57223	1001238	17.4971		

The choice to use BF test is because the data is non-normal, the BF test is quite robust. It is robust because the true significance level is very close to the nominal significance level for a large variety of distributions. It is not sensitive to symmetric heavy-tailed distributions. It uses single-factor between-subjects analysis to contrast the means of the deviation scores. Since the p-value (0.01141) is less than the level of significance (α=0.05), we reject the null hypothesis in favor of the alternative hypothesis and conclude that the differences in variances between the different days of the week is statistically significant as seen in Table 9.

Table 9: Brown and Forsythe's (BF) Test for Homogeneity of Return (%) Variance II

	N	Return (%)	
Day		**Mean**	**Std Dev**
Monday	11082	-0.0123	7.9000
Tuesday	11597	0.0429	2.9210
Wednesday	11528	-0.0187	3.2110
Thursday	11641	0.0216	2.6652
Friday	11380	0.0260	3.3680

4.3.7.3. Post-hoc analysis - Tukey Test

To establish exactly which day of the week group means are different, the Tukey's Test is performed in Figures 5 and 6. From the Tukey plot, it can be seen that there is significant difference between average return (%) between Tuesday and Monday as well as between Tuesday and Wednesday. However, there is no significant differences in returns (%) between Tuesday, Thursday and Friday.

Figure 5: Post-hoc Analysis – Tukey Test

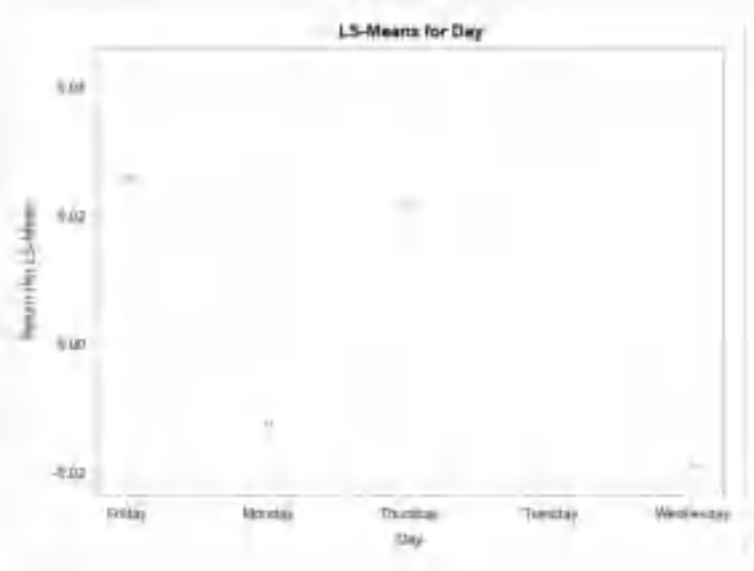
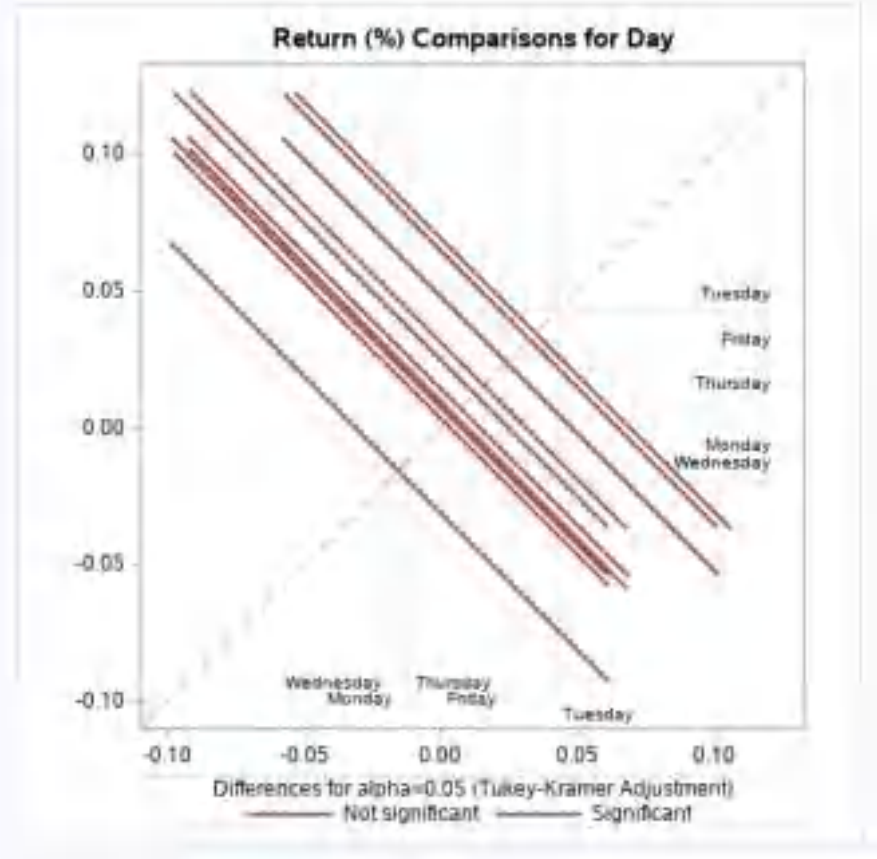


Figure 6: Tukey Kramer Adjustment



4.3.7.4. Testing for existence of autocorrelation (Heteroskedastic test) using Ljung-Box Q test

In Table 10, we identify presence of white noise in the data (serial correlation in time series), the Ljung-Box Q test is used. The test is useful as it helps checks for the overall randomness based on a number of lags and whether there is sufficient structure in the time series to make it worth modeling.

Table 10: Portmanteau Test for Cross Correlations of Residuals

Up To Lag	DF	Chi-Square	Pr > ChiSq
2	1	76.8600	<.0001
3	2	77.2900	<.0001
4	3	81.8900	<.0001
5	4	81.9300	<.0001
6	5	83.4100	<.0001
7	6	83.4300	<.0001
8	7	87.9000	<.0001
9	8	87.9100	<.0001
10	9	97.9200	<.0001
11	10	108.0900	<.0001
12	11	108.1300	<.0001

Since the p-values for the different lags are less than the level of significance (α=0.05), we reject the null hypothesis that the series is not a white noise. There are therefore patterns in the data series. The Durbin-Watson statistic in Table 11 confirms that indeed there exist positive autocorrelation in the data. Since the Durbin-Watson statistic (1.95286) is less than 2, we can conclude that there exists a positive autocorrelation in data.

Table 11: Univariate Model White Noise Diagnostics

Variable	Durbin	Normality		ARCH	
	Watson	Chi-Square	Pr > ChiSq	F Value	Pr > F
Return (%)	1.9529	9999.9900	<.0001	65.6200	<.0001

4.3.7.5.Testing for Stationarity tests and White noise checks using Dickey-Fuller Unit Root Tests

In establishing whether the time series is stationary, the dickey-fuller unit root test was used and the results are provided in the Table 12. Since the p-value is less than 0.001, we reject the null hypothesis in favor of the alternative hypothesis and therefore conclude that the data is stationary and therefore has no unit root. The series with the return only had an error term or deterministic trend. Thus, large values will tend to be followed by smaller values (negative changes), and small values by larger values (positive changes). Accordingly, the level of the series will be a significant predictor of next period's change, and will have a negative coefficient.

Table 12: Dickey-Fuller Unit Root Tests

Variable	Type	Rho	Pr < Rho	Tau	Pr < Tau
Return (%)	**Zero Mean**	-66983.0000	0.0001	-183.0000	0.0001
	Single Mean	-66985.0000	0.0001	-183.0100	0.0001
	Trend	-66989.0000	0.0001	-183.0100	0.0001

4.3.7.6. Testing for existence of day-of-week effect using Kruskal–Wallis (KW) test

Tables 13 and 14 tests for the existence of statistically significant differences between medians of three or more independent groups; and where normality assumption is violated, the Kruskal–Wallis test (1952) was used. Since the REITs data had an ordinal or continuous response variable, observations are assumed to be independent of each other and the distributions are assumed to have similar shapes, the nonparametric test, KW test, was preferred as it robust and much less sensitive to outliers than one-way ANOVA. From the results output, it can be seen that the p-value of the KW test is equal to 0.0090. Since the p-value (0.0058) is less than the level of significance (0.05), we reject the null hypothesis. We have sufficient evidence to conclude with 95% confidence that there is statistically significant difference between the median returns across the day of the week. This confirms that there exists significant day-of-the-week effect.

Table 13: Wilcoxon Scores (Rank Sums) for Variable Return (%) classified by Variable Day

Day	N	Sum of Scores	Expected Under H_0	Std Dev Under H_0	Mean Score
		Average scores were used for ties.			
Monday	11082	313311371	317105889	1502802.4800	28272.0963
Tuesday	11597	332915908	331842357	1528722.3700	28707.0715
Wednesday	11528	326888488	329867956	1525319.7100	28356.0451
Thursday	11641	336690656	333101395	1530881.0600	28922.8293
Friday	11380	327744184	325633010	1517948.8200	28800.0161

NOTE: The table provides estimates of Kruskal-Wallis Rank test for returns. It ranks days on the basis higher returns generated on each day. The subscripts m, t, w, th and f show the significance of difference associated with related day. Where, m = Monday, t = Tuesday, w = Wednesday, th = Thursday and f = Friday. While, *** shows level of sig at 1%, ** presents level of sig at 5% and * shows level of sig at 10%.

Table 14: Kruskal-Wallis Test

Chi-Square	DF	Pr > ChiSq
14.5095	4	0.0058

4.3.7.7. Post hoc test - Dwass, Steel, Critchlow-Fligner multiple comparisons post-hoc

Since the Kruskal-Wallis test p-value (0.0058) < α=0.05, we can indeed conclude with 95% confidence that there exist significant difference in the mean return (%) between at least two of the days of the week. Since we confirm existence of significant day-of-the-week effect using the KW test, there is need to ascertain with clarity which day of the week are the returns (%)

significantly different. The Dwass, Steel, Critchlow-Fligner multiple comparisons post-hoc procedure is useful in helping to determine which pairs of treatments differ significantly. Based on the results from Table16, the best day to invest in the Office, diversified and Industrial REITS was Friday, Thursday and Friday respectively. For Retail and Storage REITS, there seemed to be no significant differences in the median values and hence weak day-of-the-week effect.

Table 16: Post hoc test - Dwass, Steel, Critchlow-Fligner multiple comparisons post-hoc

No.	REITs	Days to Invest	Wilcoxon Z	DSCF value	P-value
1	Office REITS	Friday	2.5230	3.5681	0.0855*
2	Diversified REITS	Thursday	3.4418	4.8675	0.0052**
		Tuesday	2.7804	3.9321	0.0432**
3	Industrial	Friday	3.0651	4.3347	0.0185**
		Wednesday	2.5484	3.6040	0.0803*
4.	Retail REITS				
5.	Storage REITS				
Key:	* - significantly different median values at 10%				
	*** - significantly different medians values at 5%				
	*** - significantly different medians values at 1%				

4.3.7.8. OLS and GARCH Model: Model selection

The model chosen was the regression with vector autoregressive model. To test the presence of the day of the week effect in both return and the volatility equations, all the equations were estimated jointly by using the full information maximum likelihood estimation technique. The type of model chosen is Arch process order (1,0) - GARCH process order (2,1) with a representation type of dynamic A regression vector model was based on selection of an dependent variable (return (%)) and independent variables (returnLagged (rt-1, D1(dummyMonday), D2(dummyTuesday), D3(dummyWednesday), D4(dummyThursday). Friday was used as the reference category. The Akaike information criterion (AIC) criteria was used in selecting the best GARCH model fit for the data. The model with the least AIC was chosen Tables 17 and 18.

Table 17: Model Selection

Type of Model	ARX(1,0)-GARCH(2,1)
Estimation Method	Maximum Likelihood Estimation
Representation Type	DCC

Table 18: Information Criteria

AICC	150948.1000
HQC	150981.5000
AIC	150948.1000
SBC	151055.5000
FPEC	19.3723

To perform the Lagrange Multiplier Autoregressive Conditional Heteroskedastic test suggested by Engle (1982) using 12 lags, the squared residuals were regressed using the square of the error terms on its first 12 lags. A single lag for daily returns (rt-1 representing the returns of the previous day), was added in the model to capture linear dependency since it is important to use the model to estimate seasonal anomalies and capture volatility in time series data.

4.3.7.9. OLS Model Parameter Estimates on REITs' Returns

Findings from the OLS estimation in Table 19 indicate presence of autoregressive conditional heteroskedasticity components in squared variances, we model the conditional variance of return equation as a GARCH (2,1) process and re-estimate the return equation with the conditional variance equation jointly. From the analysis, it can be seen that the constant is 0.02287 and is not statistically significant since it has a p-value greater than the level of significance (α=0.05). The slope of the coefficients indicates that for every unit increment on the lag of returns, the conditional mean for returns (%) decreases by 0.03509. The conditional mean for returns (%) on Monday, Tuesday, Wednesday and Thursday were found to be higher than those of Friday by 0.02630, 0.02436, 0.13345, 0.03070 respectively. The p-value of the slope for the lag of return (0.0001) and Wednesday (p=0.0001) was significant while the p-value for the slope of Monday (p=0.3136), Tuesday (p=0.3421) and Thursday (p=0.2379) was not significant. However, the slope for Wednesday (p=0.0001) was found to be significant and hence there was significant difference in the conditional average returns (%) between Friday and Monday.

The equation is given below:

Returns = - 0.03509 + -0.13898rt-1 + 0.02630M+ 0.02436T+ 0.13345W+ 0.03070T (Eq. 2)

Table 19: OLS Model Parameter Estimates on REITs' Returns

Parameter	Estimate	Standard Error	t Value	Pr > |t|	Explanation of Variable
Constant	0.0351	0.0183	1.9100	0.0557	1
B_0	-0.1390	0.0052	-26.6700	0.0001	Coefficient for lagged Return (%)(r_{t-1}) t))
β_1	0.0263	0.0261	1.0100	0.3136	Coefficient for Dummy variable Monday(t)
B_2	0.0244	0.0256	0.9500	0.3421	Coefficient for Dummy variable Tuesday(t)
B_3	0.1335	0.0255	5.2400	0.0001	Coefficient for Dummy variable Wednesday(t)
β_4	0.0307	0.0260	1.1800	0.2379	Coefficient for Dummy variable Thursday(t))

4.3.7.10. Incorporating GARCH variance model into the OLS equation

Time series data are subject to variation across time that makes the results obtained from OLS spurious and inefficient to predict results. Given the limitation caused by modelling time series data using simple OLS, and multivariate analysis of variance (MANOVA) which do not account for autocorrelation and heteroskedasticity, generalized autoregressive conditional heteroskedasticity (GARCH) was employed. The analysis on market index generally finds a significant response in the mean and variance equations similarly with the simple GARCH model and the results of the day of the week effect are also the same. In the GARCH model, the coefficients referring to Friday, Thursday and Friday are positively significant at conventional levels for Office, Diversified and Industrial REITs respectively. This indicates a day of the week effect for the daily REIT index data. To make it more specific to this study, the coefficients of the dummies for the days of the week were incorporated in the GARCH variance equation in Table 20. Returns are regressed with the constant in mean equation which provides the day of the week effect in conditional mean. A GARCH process is estimated as follows:

$$h_t = \alpha + \beta h_{t-1} + we_{t-1} + \sum_{j=1}^{5} \delta_j D_j \qquad \text{(Eq. 3)}$$

Where:
ht is the conditional volatility,
βht-1 shows the effect of shocks,
w£t-1 indicates the response of volatility to the shocks.

GARCH variance model equation:
Ht = 0.11028 + 0.07845+ 0.79069+ 0.12854 + 0.02630M+ 0.02436T+ 0.13345W+ 0.03070T (Eq. 4)

Where; M – Monday, T – Tuesday, W – Wednesday, Th – Thursday

Table 20: GARCH Model Parameter Estimates on REITs' Returns

Parameter	Estimate	Standard Error	t Value	Pr > |t|
DCCA	0.1000	0.0000		
DCCB	0.1000	0.0000		
GCHC1_1	0.1103	0.0051	21.70000	0.0001
ACH1_1_1	0.0785	0.0023	34.01000	0.0001
GCH1_1_1	0.7907	0.0307	25.75000	0.0001
GCH2_1_1	0.1285	0.0288	4.47000	0.0001

NOTE: The table displays statistics for GARCH (1, 1), for mean equation only. In each row coefficients, t-statistics and level of significance are presented. Where, *** demonstrates level of sig at 1%, ** presents level of sig at 5% and * shows level of sig at 10%

5.0. Conclusion

Significant differences in REIT returns and traded volume on different days were observed in all markets where Monday is the least traded day in most market. Based on the analysis, the best day to invest in the Office REITs is Friday, diversified REITs on Thursday and Industrial REITs on Friday. For Retail and Storage REITs, there seemed to be no significant differences in the median values and hence a weak day-of-the-week effect. Day of week effect is a calendar anomaly in which some days have relatively high or relatively low returns than other days of week. This is interesting due to relationship between day of week and magnitude of return associated with that particular day of week. Day-of-the-week effect was initially recognized in US market as Monday effect—lower or negative returns on Monday and higher or positive returns on Friday. Different patterns have been identified through other markets and on different time periods. On the one hand, these findings are consistent with the findings of Onyuma (2009) and Mokua (2003), who found that Monday produces the lowest negative returns, while Friday produces the largest positive returns, using regression analysis, data on prices and adjusted returns derived from the NSE 20 index in Kenya between 1980 and 2006. Our results, however, are in direct opposition to those of Poterba and Weisbenner (2001) and Basher and Sadorsky (2006), who observed negative Tuesday between 1992 and 2003. Nishat and Mustafa (2002) noticed that the day of the week changed with the settlement era. For example, statistical mistakes, volatility changes, settlement methods and the recurrence of unfavorable updates at specific moments in time are all used to expound on these issues. Strategies taken by investors due to this news resulting in different patterns may be one of the reasons. Objective of this study was to find out if there still exists the day of week effect and by using daily returns data. The examined categories within South African REITs include office, diversified, industrial, retail, and storage REITs. While daily volumes are also taken for these categories, just for checking day of week in volume and symmetric response of volatility in volumes. The sample period starts from August 1, 2013 to December 31, 2021 for all investigated categories of SA REITs.

Three (3) models are used to examine the impact of the weekday and market liquidity on return series from SA REIT categories. The first is a simple OLS regression with five dummies to identify the weekday influence in linear regression. Non-parametric tests are classified into two types: For all days of the week, GARCH-M employs OLS AR's mean equation and variance equation. In the variance equation, vulnerability may vary by day of the week. The returns and volumes of all SA REIT categories were influenced by the day of the week. Investing in office,

diversified, and industrial REITs performed best in South Africa on Fridays, Thursdays, and Fridays, respectively, where statistically significant changes in variances were seen. Wednesday was the least profitable day, with the lowest daily average return, while Tuesday was the most profitable day, with the highest daily average return. The most REITs were traded on Friday, while the fewest REITs were traded on Monday. Return volatility peaked on Monday, while volume volatility peaked on Thursday. These findings do not appear to be compatible with past studies (Poterba & Weisbenner, 2001; Basher & Sadorsky 2006) in this field. This might be because of the employment of updated models and a different sample period. Stock return patterns can help investors make more informed investment decisions, while volatility patterns can help them estimate the risk / returns associated with any given day. Risk / returns, as well as how good or bad news influences stock returns, all influence investment decisions.

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Appendix

A. Descriptive summary of return (%) and volume based on days of the week and type of REITS

Day	REITS	Obs	Variable	Mean	Std Dev	Min	Max	Std Error	Lower 95% CL for Mean	Upper 95% CL for Mean	Coeff of Variation	Skewness	Kurtosis
Monday	Diversified REITS	4380	Return (%)	-0.1162	2.9274	-62	104	0.0442	-0.2029	-0.0295	-2519.0300	7.5076	418.4403
			Volume	2655800.4500	5215690.5600	0	83319284	78808.8100	2501295.3200	2810305.5800	196.3886	4.9484	41.8198
	Industrial REITS	787	Return (%)	-0.1067	1.8351	-15	16	0.0654	-0.2351	0.0217	-1719.3500	-0.1047	19.9750
			Volume	302926.2100	592889.9300	0	8117005	21134.2400	261439.9700	344412.4500	195.7209	5.5884	52.9305
	Office REITS	1308	Return (%)	-0.0252	3.7669	-25	26	0.1042	-0.2296	0.1791	-14930.800	0.4354	13.7499
			Volume	503232.8800	1013582.0200	0	17668762	28025.6100	448252.7800	558212.9700	201.4141	6.6505	78.6336
	Retail REITS	4306	Return (%)	-0.0590	3.2455	-89	26	0.0495	-0.1560	0.0380	-5502.1000	-5.2464	147.3478
			Volume	656649.4300	1565637.0900	0	50338012	23859.1000	609873.3000	703425.5600	238.4281	15.4813	384.0140
	Storage REITS	301	Return (%)	2.4718	44.1808	-28	762	2.5465	-2.5396	7.4831	1787.4200	17.0466	294.0056
			Volume	137806.2800	433734.9400	0	5039637	25000.0700	88608.5700	187003.9800	314.7425	7.3106	67.5171
Tuesday	Diversified REITS	4583	Return (%)	0.0868	2.2793	-20	22	0.0337	0.0208	0.1528	2624.5800	1.1912	15.4327
			Volume	3034718.8100	6039750.3700	0	77920417	89216.2700	2859811.9300	3209625.6900	199.0217	4.7777	35.4505
	Industrial REITS	821	Return (%)	0.0512	1.7579	-12	11	0.0613	-0.0693	0.1716	3436.1900	-0.3927	9.5110
			Volume	337738.3200	563084.0600	0	4220650	19651.7700	299164.6200	376312.0100	166.7220	2.7374	9.3796
	Office REITS	1368	Return (%)	0.0409	3.3306	-17	33	0.0900	-0.1357	0.2176	8136.1000	2.4108	23.2181
			Volume	556812.6300	1309457.3700	0	25580378	35403.6700	487361.2200	626264.0500	235.1702	11.4615	198.1163
	Retail REITS	4510	Return (%)	0.0195	2.9279	-22	48	0.0436	-0.0660	0.1050	15005.5700	2.0798	34.2659
			Volume	736568.8100	1844709.8000	0	86678406	27468.8100	682716.4800	790421.1400	250.4464	25.3798	1072.160
	Storage REITS	315	Return (%)	-0.2730	7.7259	-87	35	0.4353	-1.1295	0.5835	-2829.8400	-5.2969	59.8502
			Volume	125349.5600	460031.3400	0	6863606	25919.8300	74351.0500	176348.0600	366.9988	10.8076	148.9611
Wednesday	Diversified REITS	4554	Return (%)	0.0371	3.2099	-20	158	0.0476	-0.0561	0.1304	8649.5500	26.3912	1291.880
			Volume	3085189.7900	6072468.1800	0	86315241	89984.7100	2908776.1000	3261603.4900	196.8264	4.6221	34.2778
	Industrial REITS	817	Return (%)	0.0783	1.8705	-13	13	0.0654	-0.0501	0.2068	2387.8100	-0.0476	10.1452
			Volume	359968.7700	675921.0800	0	6597564	23647.4900	313551.7000	406385.8400	187.7721	3.5960	18.2305
	Office REITS	1359	Return (%)	-0.2178	2.9807	-15	19	0.0809	-0.3764	-0.0592	-1368.5200	-0.0678	7.4783
			Volume	551425.6300	1222749.9000	0	18571281	33168.6600	486358.2600	616493.0000	221.7434	7.5471	81.3996
	Retail REITS	4485	Return (%)	-0.0355	2.8345	-22	35	0.0423	-0.1184	0.0475	-7995.3400	0.9507	16.9709
			Volume	770959.5600	3214174.2400	0	1.93E+08	47994.1400	676867.3800	865051.7400	416.9057	48.4627	2856.340
	Storage REITS	313	Return (%)	0.0192	8.1881	-29	129	0.4628	-0.8915	0.9298	42714.4400	12.4202	198.9096
			Volume	106635.3100	269015.3600	0	2825745	15205.6500	76716.7300	136553.8800	252.2761	5.7051	43.1090
Thursday	Diversified REITS	4598	Return (%)	0.0570	2.1193	-23	24	0.0313	-0.0043	0.1183	3719.2900	0.5732	21.5699
			Volume	3420593.8300	7279591.4000	0	1.19E+08	107355.060	3210126.3700	3631061.3000	212.8166	5.1273	41.0777
	Industrial REITS	825	Return (%)	0.0461	1.6003	-12	10	0.0557	-0.0633	0.1554	3474.3500	-0.1964	9.4427
			Volume	393650.7200	1163894.3400	0	26141619	40521.6000	314113.0200	473188.4300	295.6668	14.3858	295.5861
	Office REITS	1371	Return (%)	-0.0926	3.5695	-32	29	0.0964	-0.2817	0.0965	-3853.3300	0.2234	25.1348
			Volume	618140.9200	1538008.5800	0	28274669	41537.4700	536656.9900	699624.8500	248.8120	9.6321	131.1550
	Retail REITS	4528	Return (%)	0.0106	2.6908	-23	42	0.0400	-0.0678	0.0890	25383.2800	1.6784	31.1846
			Volume	727633.9900	1274227.0500	0	24909281	18936.2300	690509.7200	764758.2500	175.1192	6.6409	77.4772
	Storage REITS	319	Return (%)	0.0940	5.5130	-66	28	0.3087	-0.5133	0.7013	5862.2000	-4.6502	68.4045
			Volume	285589.4700	2009250.2200	0	32477103	112496.410	64258.1800	506920.7600	703.5449	13.8676	212.8785
Friday	Diversified REITS	4497	Return (%)	0.0013	2.2729	-61	30	0.0339	-0.0651	0.0678	170351.370	-3.4167	131.5578
			Volume	3492239.0400	11604556.090	0	4.92E+08	173048.200	3152979.4600	3831498.6100	332.2956	22.7093	806.6832
	Industrial REITS	806	Return (%)	0.2692	2.6216	-9	50	0.0923	0.0880	0.4505	973.7357	9.2565	164.3337
			Volume	461076.3200	1077995.4900	0	13604940	37970.7700	386542.9100	535609.7200	233.7998	6.2015	56.8222
	Office REITS	1341	Return (%)	0.0694	3.6594	-22	47	0.0999	-0.1267	0.2654	5276.6700	1.9394	30.9474
			Volume	616494.2900	1257850.2800	0	13920718	34349.0400	549110.5600	683878.0300	204.0328	5.2374	37.6788
	Retail REITS	4426	Return (%)	-0.0221	2.6706	-28	23	0.0401	-0.1008	0.0566	-12061.350	-0.2828	14.8024
			Volume	797980.5700	2082468.5400	0	82498104	31302.0500	736612.9000	859348.2400	260.9673	18.7430	600.5691
	Storage REITS	310	Return (%)	0.2516	12.8141	-20	209	0.7278	-1.1804	1.6837	5092.7900	14.1643	229.7786
			Volume	226743.0000	1352468.2400	0	21259346	76815.0300	75596.2900	377889.7100	596.4763	13.1071	194.3224

B. Pairwise Two-Sided Multiple Comparison Analysis using Dwass, Steel, Critchlow Fligner Method

i. Diversified REITS: Pairwise Two-Sided Multiple Comparison Analysis

Pairwise Two-Sided Multiple Comparison Analysis			
Dwass, Steel, Critchlow-Fligner Method			
	Variable: Return (%)		
Day	**Wilcoxon Z**	**DSCF Value**	**Pr > DSCF**
Tuesday vs. Monday	2.7804	3.9321	0.0432
Wednesday vs. Tuesday	-0.8797	1.2441	0.9045
Wednesday vs. Monday	1.9157	2.7092	0.3088
Thursday vs. Wednesday	1.5143	2.1416	0.5531
Thursday vs. Tuesday	0.6214	0.8788	0.9717
Thursday vs. Monday	3.4418	4.8675	0.0052
Friday vs. Thursday	-1.0815	1.5295	0.8162
Friday vs. Wednesday	0.4405	0.6229	0.9922
Friday vs. Tuesday	-0.4446	0.6288	0.9919
Friday vs. Monday	2.368	3.3488	0.1241

ii. Industrial REITS: Pairwise Two-Sided Multiple Comparison Analysis

Pairwise Two-Sided Multiple Comparison Analysis			
Dwass, Steel, Critchlow-Fligner Method			
	Variable: Return (%)		
Day	**Wilcoxon Z**	**DSCF Value**	**Pr > DSCF**
Tuesday vs. Monday	-0.3790	0.5359	0.9956
Wednesday vs. Tuesday	-1.2064	1.7061	0.7477
Wednesday vs. Monday	-1.5415	2.1800	0.5353
Thursday vs. Wednesday	1.5294	2.1629	0.5432
Thursday vs. Tuesday	0.3164	0.4475	0.9978
Thursday vs. Monday	-0.0727	0.1028	1.0000
Friday vs. Thursday	1.0285	1.4544	0.8423
Friday vs. Wednesday	2.5230	3.5681	0.0855
Friday vs. Tuesday	1.3370	1.8908	0.6680
Friday vs. Monday	0.9136	1.2920	0.8918

iii. Storage REITS: Pairwise Two-Sided Multiple Comparison Analysis

Pairwise Two-Sided Multiple Comparison Analysis			
Dwass, Steel, Critchlow-Fligner Method			
	Variable: Return (%)		
Day	**Wilcoxon Z**	**DSCF Value**	**Pr > DSCF**
Tuesday vs. Monday	0.3851	0.5446	0.9953
Wednesday vs. Tuesday	-1.2514	1.7697	0.7210
Wednesday vs. Monday	-0.8715	1.2325	0.9074
Thursday vs. Wednesday	1.5357	2.1718	0.5391
Thursday vs. Tuesday	0.1123	0.1588	1.0000
Thursday vs. Monday	0.5918	0.8370	0.9763
Friday vs. Thursday	-1.6222	2.2941	0.4830
Friday vs. Wednesday	-0.1809	0.2558	0.9998
Friday vs. Tuesday	-1.4248	2.0150	0.6116
Friday vs. Monday	-1.0162	1.4372	0.8480

iv. Retail REITS: Pairwise Two-Sided Multiple Comparison Analysis

Pairwise Two-Sided Multiple Comparison Analysis			
Dwass, Steel, Critchlow-Fligner Method			
Variable: Return (%)			
Day	**Wilcoxon Z**	**DSCF Value**	**Pr > DSCF**
Tuesday vs. Monday	-0.0416	0.0589	1.0000
Wednesday vs. Tuesday	-0.9125	1.2905	0.8922
Wednesday vs. Monday	-0.9630	1.3619	0.8717
Thursday vs. Wednesday	1.5751	2.2275	0.5134
Thursday vs. Tuesday	0.6346	0.8974	0.9695
Thursday vs. Monday	0.5747	0.8128	0.9788
Friday vs. Thursday	-0.3502	0.4953	0.9968
Friday vs. Wednesday	1.2089	1.7097	0.7462
Friday vs. Tuesday	0.2695	0.3811	0.9988
Friday vs. Monday	0.2281	0.3226	0.9994

BARRIERS TO THE ADOPTION OF SMART HOUSING CONCEPT IN AFRICAN SMART CITY PROJECTS

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Abstract

A city can be termed smart when it is able to effectively apply ICT and other smart technologies in achieving intelligent solutions to everyday challenges posed by the city. In view of this, smart housing concept leverage on smart technologies and data to solve housing problems in smart city projects. In most African smart city projects, the problem lies with the numerous hindrances on techniques to theadoption of Smart housing solutions.The initiative of Nigeria Smart City Initiative (NSCI) is to transform Nigerian major urban centers from traditional dysfunctional cities to modern, efficient, responsive ones capable of satisfying the needs of present and future generation of Nigerians.Using Akwa Millennium City project in Nigeria, this study examines the barriers to the adoption of smart housing concept in African smart city projects. Structured questionnaires were purposively administered to all the staff of Akwa Millennium City project while all retrieved questionnaires were found suitable for analysis. Descriptive statistics was employed to analyze the data collected from the respondents. Findings depicted that the major barriers could be classified as socio-economic, technical and policy hindrances in the delivery of smart housing in Akwa Millennium City project in Nigeria. It's noteworthy that smart housing concept could be unaffordable due to the most perceived barriers (such as limited consumer demand, retrofitting of existing homes and buildings, lack of financial and financing incentives, high cost of development, and smart technology as divisive, exclusive or irrelevant) in the development of African smart city projects. This study therefore recommends that developers should focus on socio-economic attributes in the adoption of smart housing concept to achieve an effective planning of smart city projects in Nigeria and Africa at large.

Keyword: Akwa Millennium City, Africa, ESG, Smart Housing, Smart City, SDGs11
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1.0. Introduction

Smart city as a concept adopt the use of data, information and other smart technologies in achieving smart solutions to everyday challenges posed by the city (Dameri & Rosenthal-Sabroux, 2014). The concept has been generally adopted to be a solution to creating an enabling future environment that is technologically driven, resource efficient, and providing an affordable home through this process (Gobbo, Souza & Gobbo, 2016). In view of this, smart housing leverage on data, information and smart technologies to solve housing problems in smart city projects.

Smart cities create collaboration opportunities between public and private sectors which include; the circular economy, smart governance, social cohesion, public management, smart transportation, smart environment and smart logistic among others. Most literatures focus on the technological aspect of the smart city and data sharing (Emmanuel, 2014; Gosden, 2014; Greenough, 2015; Gobbo, Souza & Gobbo, 2016; RICs, 2019). Few studies emphasised on the opportunities the smart technologies can create in the urban environment while projecting ICT as a means of making a city smart (Aliyu & Amadu, 2017; Odefadehan, 2021). The claim is that smart housing can come up with the smart technologies and technical know-how of facilities that makes for a smart city project.

In smart housing concept, smart cities are conceptualized as metropolitan areas housing smart urban dwellers with a high level of education can easily adopt smart technologies in the developmental activities of the cities. This assertion is that the highly educated urban dwellers are the major drivers of technology innovations in smart city. In view of this, the problem lies with the numerous hindrances on techniques to the adoption of smart housing solutions. These problems include privacy and data security, lack of understanding user needs, irrelevant of some smart technology, and regulatory barriers in smart city development projects (Odefadehan, 2021).

The initiative of Nigeria Smart City Initiative (NSCI) is to transform Nigerian major urban centers from traditional dysfunctional cities to modern, efficient, responsive ones capable of satisfying the housing needs of present and future generation of Nigerians. The modalities of smart housing concept could provide a better solution to the housing and urbanization in Nigerian cities. For instance, cities like Lagos, Abuja, Kano, Kaduna, Akwa are experiencing challenges as regards housing, inadequacy of infrastructural facilities. Housing has been a major issue in Nigerian cities as there is an exponential increase in population growth in urban

areas and the available housing in cities is not affordable to the middle-and low-income earners. Using Akwa Millennium City project in Nigeria, It is therefore pertinent for this study to examine the barriers to the adoption of smart housing concept in African smart city projects.

2.0. Literature Review

The delivery of smart housing concepts and technologies in smart city projects can be hindered by several factors. According to Gobbo, Souza and Gobbo (2016) informal settlement of urban sprawl and the need for affordable homes makes the adoption of smart housing concepts in cities difficult. Barriers of smart housing concepts have been outlined in various studies (Greenough, 2015; Gobbo, Souza & Gobbo, 2016; Aliyu & Amadu, 2017; Odefadehan, 2021). The study of Edwards and Grinter (2001) highlighted the barriers of smart housing concepts as interoperability, devices, appliances and systems from different vendors to operate together, administration, reliability, system intelligence and behavior interference, and data security. Furthermore, Holroyled et al., (2010) identified other barriers such as the retrofitting of existing homes and buildings, associated cost of fixing smart devices, and usability. The study of Ciesielska and Li (2011) outlined the lack of understanding of user needs, and infrastructure solutions as the major smart housing barriers. Due to the introduction of innovations and technologies applied in smart housing concept, recent studies outlined the major barriers in developing countries as follows (Emmanuel, 2014; Gosden, 2014; Greenough, 2015; Gobbo, Souza & Gobbo, 2016; Aliyu & Amadu, 2017; Odefadehan, 2021):

Administration.
High Costs of development.
Limited consumer demand/ Unaffordability.
Long replacement cycles.
Ageing of electric infrastructure.
Macroeconomic barriers.
Lack of skilled and specialised workers.
Incipient micro energy generation market.
Regulatory barriers.
Sharing infrastructure responsibilities and costs.
Fragmented energy market structure.
Tax system for energy micro generation.
Lack of financial and financing incentives.
Usability.
Lack of understanding user needs.

Loss of control and apathy.
Smart technology as divisive, exclusive or irrelevant.
Communication with consumers.
Difficulty to change consumer behaviour.
Theft and fraud in electricity distribution system.
Interoperability.
Reliability.
Systems intelligence and behaviour inference.
Privacy and data security.
Retrofitting of existing homes and buildings.
Complexity.
Slow and precarious electrical system recovery from power interruptions.

However, the study of Gobbo, Souza & Gobbo (2016) classified these barriers under four major categories. These are social, economic, policy, and technical challenges.

The findings of most of the studies though focused on the barriers of smart housing concepts, but lack the empirical studies on its adoption in the smart city projects. This may be due to few or no empirical research that has been carried out on this subject area. This study therefore set to fill the gap in the literatures.

3.0. Methodology

Akwa Millennium City project in Nigeria was selected as the case study area while all the staff of Akwa Millennium City project was considered as the target population for this study. The sample size of this study consists of all the 25 staff of Akwa Millennium City project in Nigeria. Personal interview and questionnaire administration were the primary data collection adopted for this study. Secondary data collection sources include the review of relevant literature in the subject area. Structured questionnaires were purposively administered to all the staff of Akwa Millennium City project while all retrieved questionnaires were found suitable for analysis. The data collected were analyzed using descriptive statistics (i.e frequencies, weighted mean score, standard deviation and ranking order). Descriptive statistics was adopted to examine the perceived barriers to the delivery of smart housing concept in Akwa Millennium City project in Nigeria.

4.0. Result and Discussions

The discussions of results generated from the analysis are presented in this section. The socio-economic background of respondents in the case study area is shown in Table 1 below.

Table 1. Socio-economic background of respondents

Background	Frequency	Percentage (%)
Gender		
Male	19	76
Female	6	24
Total	**25**	**100**
Age of Respondents		
20-30year s	4	16
31-40year s	14	56
41year s and above	7	28
Total	**25**	100
Staff Profile		
Contr act/per manent Staff	21	84
Par t-Time Staff	4	16
Total	**25**	**100**
Profession		
Ar chitect	2	8
Quantity Sur veyor	3	12
Engineer	15	60
Pr oject Manager	4	16
Ar tisan	1	4
Total	**25**	100
Educational Background		
HND	1	4
B.Tech/B.Sc	6	24
Post Gr aduate	18	72
Total	**25**	**100**
Professional Qualification		
Gr aduate Member	5	20
Associate Member	17	68
Fellow member	3	12
Total	**25**	**100**
Years of Experience		
0 – 5 year s	10	40
6 – 10 year s	12	48
11 year s and Above	3	12
Total	**25**	**100**

Table 2 above indicates that majority of the respondents were male while 56% of the respondents are within the age bracket of 31 – 40 years. Majority of the staff are full-time employee while minority is part-time staff. The profession of the staff indicates that 8% were Architect, 12% were Quantity Surveyor, 60% were Engineer while 16% were Project Manager and 4% were Artisan. This implies that most of the respondents were engineers (these include site engineer, civil engineer, structural engineers etc.) Furthermore, majority (72%) of the respondents had studied up to post graduate level (these include Master degree and PhD degree), 24% were Bachelor of Technology (B.Tech) or Bachelor of Science (B.Sc) and 4% were Higher National Diploma (HND) holders. This implies that majority of the respondent's qualification were masters and PhD degree holder. Professional qualifications indicate that 68% of the respondents were associate members of their various professional bodies, 20% were graduate member while 12% were fellow members. It is noteworthy that majority of the respondents are professionally registered, affiliated and recognized by their respective professional bodies. Furthermore, all respondents had the adequate work experience; 48% had experience between 6 – 10 years, 40% had worked below 5 years while 12% had over 15 years.

Table 2. Perceived barriers to the delivery of Smart Housing Concept in Akwa Millennium City project

Barriers	N	Mean	Std. Deviation	Rank
Limited Consumer Demand/Unaffordability.	25	4.20	.408	1st
Retrofitting of Existing Homes and Buildings.	25	3.96	.841	2nd
Lack of Financial and Financing Incentives.	25	3.92	.400	3rd
High Cost of Development.	25	3.92	.812	3rd
Smart Technology as Divisive, Exclusive or Irrelevant.	25	3.80	1.000	5th
Theft and Fraud in Electricity Distribution System.	25	3.72	.678	6th
Slow and Precarious Electrical System Recovery from Power interruptions.	25	3.68	.748	7th
Regulatory Barriers.	25	3.64	.810	8th
Ageing of Electric Infrastructure.	25	3.56	.507	9th
Long Replacement Cycles.	25	3.56	.507	10th
Reliability.	25	3.52	1.005	11th
Administration.	25	3.52	.872	11th
Difficulty to Change Consumer Behaviour.	25	3.48	.510	13th
Incipient Micro Energy Generation Market.	25	3.48	.510	13th
Complexity.	25	3.44	.712	15th
Loss of Control and Apathy.	25	3.36	.810	16th
Tax System for Energy Micro Generation.	25	3.20	.408	17th
Interoperability.	25	3.08	.640	18th
Fragmented Energy Market Structure.	25	2.80	.408	19th
Lack of Understanding User Needs.	25	2.52	.823	20th
Sharing Infrastructure Responsibilities and Costs.	25	2.48	.714	21st
Macroeconomic Barriers.	25	2.48	.872	21st
System Intelligence and Behaviour Inference.	25	2.40	.816	23rd
Privacy and Data Security.	25	2.28	.458	24th
Usability.	25	2.00	.000	25th
Communication with Consumers.	25	1.76	.436	26th
Lack of Skilled and Specialized Workers.	25	1.72	1.208	27th
Valid N (listwise)	**25**			

Table 2 above shows the perceived barriers to the delivery of Smart Housing Concept in Akwa Millennium City project in Nigeria. Findings depicted that limited consumer demand (4.20), retrofitting of existing homes and buildings (3.96), lack of financial and financing incentives (3.92), high cost of development (3.92), and smart technology as divisive, exclusive or irrelevant (3.80) were the most rated barriers to the delivery of smart housing concept in smart city project in the case study area. This implies that smart housing may not be affordable due to the limited consumer demand. However, these barriers could be classified as the socio-economic, policy, and technical challenges in the adoption of smart housing concept in African smart city projects. Furthermore, theft and fraud in electricity distribution system (3.72) ranked 6th, followed by slow and precarious electrical system recovery from power interruptions (3.68) ranked 7th while regulatory barriers (3.64) ranked 8th. These could be attributable to the technical and policy challenges in the delivery of smart housing in African smart city projects.

Other barriers (such as ageing of electric infrastructure, long replacement cycles, reliability, and administration) with lower mean scores were slightly rated as the challenges to the delivery of smart housing concepts in the case study area. Findings also indicated that macroeconomic barriers, system intelligence and behaviour inference, privacy and data security, usability, communication with consumers, lack of skilled and specialized workers with the lowest mean scores were the least rated barriers to the adoption of smart housing concept in the smart city project. These barriers could as well be classified as socio-economic hindrances in the delivery of smart housing in African Smart City projects. The need for IT expert could help to facilitate the use of smart technologies (such as smart grid, Artificial Intelligence) in the delivery of smart housing concept in the project. These findings are in consistent with the study of Akinwamide & Hahn (2021) that the development of Eko Atlantic city has led to the application of smart city in Nigeria to upgrade its major cultural and innovative cities (such as Akwa Millennium City project in Anambra state).

5.0. Conclusion

This study has examined the barriers to the adoption of smart housing concept in African smart city projects using Akwa Millennium City project in Nigeria. It's noteworthy that smart housing concept could be unaffordable due to the most perceived barriers (such as limited consumer demand, retrofitting of existing homes and buildings, lack of financial and financing incentives, high cost of development, and smart technology as divisive, exclusive or

irrelevant) in the development of African smart city projects. Furthermore, socio-economic hindrances (such as communication with consumers, macroeconomic barriers, usability, and lack of skilled and specialized workers) were the least barriers to the adoption of smart housing concept in Akwa Millennium City project. It's therefore recommended that developers should focus on socio-economic attributes in the adoption of smart housing concept to achieve an effective planning of smart city projects in Nigeria and Africa at large.

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INVESTMENT PERFORMANCE AND INTEGRATION ANALYSIS OF INDIRECT REAL ESTATE AND OTHER LISTED ASSETS:

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Abstract

Purpose: This study examined the investment performance and level of integration between indirect real estate and other listed investment assets in the Nigerian property market. This is to determine the assets' performance and the long-run relationship between the assets thereby establishing the diversification benefits of combining these assets in a mixed-asset portfolio in an emerging African market.

Design/Methodology/Approach: The data collected comprised quarterly returns on the indirect real estate asset and the other listed investments for the period of January 2009 to December 2020. The other listed investment assets were the five major sectorial indexes in the Nigerian Stock Exchange (NSE) market which are NSE Banking, NSE Oil and Gas, NSE Industrial, NSE Insurance and NSE Consumer. The indices of these sectors were obtained from the daily list of the NSE. While the investment performance of the assets was analysed using holding period return, standard deviation, return-risk ratio and correlation analysis, the Augmented Dickey-Fuller (ADF) and Johansson integration tests were employed in analyzing the level of integration between the assets.

Findings: The results revealed that while indirect real estate outperformed other listed assets in terms of returns, it only outperformed three of the listed assets in terms of risk. The return-risk ratio showed that indirect real estate outperformed other listed assets. The study established a high level of integration between indirect real estate assets and other listed investment assets. This indicates that the assets have long-run convergence and have similar reactions to market fundamentals. This study concluded that given the high level of

integration of indirect real estate assets and other listed investment assets, investors should not consider the combination of these assets in an investment portfolio as they will bring little or no diversification benefit in the long run.

Practical Implications: The paper implied that the inclusion of indirect real estate assets and other listed investment assets in a domestic portfolio could be expected to yield little or no diversification benefit.

Originality/value: The paper represents one of the few attempts to determine the long-run relationship between indirect real estate assets and other listed assets from an emerging market perspective.

Keywords: integration, real estate asset, diversification benefits, performance analysis, return-risk analysis

1.0. Introduction

Diversification is one of the strategic means adopted by investors and portfolio managers who are considering the combination of investment assets in a portfolio. However, underlining the optimal combination of assets in a portfolio is the understanding of the relationship and similarity between investment assets. To this end, the relationship between real estate asset and other investment assets have been of concern to both practitioners and academics (Chen et al., 2019). The understanding of the relationships between real estate assets and other investment assets has become important to institutional investors owing to the need to reduce investment risk and enhance optimal returns through asset diversification. Extant studies such as Newell and Webb (1998), Corgel et al. (1998) and Hoesli et al. (2002) have posited that in making diversification choices, investors show some measure of preference for real estate assets, relative to other investment types, owing to its superlative investment performance.

Property investment had often been more of a direct investment in real estate assets (Amidu et al., 2007), which was quite capital intensive. However, with the emergence of the security market, and the need to circumvent the capital-intensive attribute of the direct real estate asset, investors have looked into the indirect real estate asset as a more liquid means of investing in the real estate asset class (Lizieri and Satchell 1997). Indirect real estate assets are

property listed shares or real estate investment trusts (REITs) which are publicly traded in the capital market and backed up by direct investment in real estate assets. Ownership of indirect real estate assets is passive as different from direct ownership interests in direct real estate. Thus, the increasing preference for indirect real estate assets through listed/securitised properties and REITs is predicated on the expectation that the indirect real estate assets will behave synonymously like the underlying direct real estate asset being traded, and not like the stock market. Investors have thus considered the combination of indirect real estate assets with other listed investment assets in a portfolio to maximize profit at considerable risk levels (Yunus, 2013). However, where investors aim to reduce their risk exposure and enhance investment returns, there is the need to understand the long-run relationship between indirect real estate assets and other investment assets. One major strategy to achieve risk reduction and return enhancement in a portfolio is to combine segmented investment assets. Thus, of concern to investors is the determination of the level of integration or otherwise of investment assets. This concern becomes amplified given that extant studies (Cauchie and Hoesli, 2006; Liow, 2010; Olaleye and Ekemode, 2014) have found some measure of communality between indirect real estate assets and other investment assets.

Conclusions from extant literature have turned out mixed outcomes indicating that the extent of integration varies over time and across different economies. Despite these series of studies, the assessment of the integration of indirect real estate assets with other investment assets across markets remains important for investors and portfolio managers interested in asset combination and diversification. In addition, the bulk of the extant literature are from the developed markets, with varying investment indices, as such, the results obtained from these studies cannot explain what is obtainable in an emerging African market like Nigeria.

To this end, this paper assessed the level of integration of indirect real estate assets and the five major sectorial indexes in the Nigeria Stock Exchange (NSE). This study is important as it provides analytical information to both international and domestic investors who wish to explore the advantage of the growing internalization of the real estate market and as such intends to integrate indirect real estate assets with the five major sectorial indexes of the NSE market. Also, this study provides information to portfolio managers on the long-run characteristics of indirect real estate assets as this will enhance their decision-making process when forming portfolios that may include indirect real estate assets.

2.0. Literature Review

Various studies have assessed the level of integration between indirect real estate assets and other investment assets. Liow (2004) submitted that there is a long-term correlation between prices for all stocks (including land stock) and property prices. Previous studies such as Liu et al. (1990) have previously found that the stock market is integrated with the securitized property market in the US. The study also found, however, that the stock market was segmented from the US commercial real estate market. In another analysis, Myer and Webb (1993) analysed the relationship between retail shares and property shares in the United States. The result showed that the retail stocks and indirect property influenced each other. Li and Wang (1995) studied whether the listed property market has been separated from the stock market. The study found that integration exist between the indirect real estate and the US stock market. Eicholthz and Hartzell (1996) examined the relationship between property stock and equities in the USA, United Kingdom and Canada. The results established the existence of a strong relationship between listed assets and property shares.

In addition, in UK, Lizieri and Satchell (1997) while investigating the relationship between the indirect real estate returns and the total equity market returns found a strong correlation between the indirect real estate returns and other stock returns. Glascock, Lu, and So (2000) examined the relationship and convergence between REITs, non-real assets and bonds. The study found that REITs and stocks have similar behaviour but are less cointegrated with bonds. In Hong Kong, Tse (2001) found that stock price changes were influenced by unexpected changes in residential and office buildings in Hong Kong. Clayton and MacKinnon (2001) found that listed property is very closely linked to other listed assets. Also, Kim (2004) identified a longstanding and contemporary connection between wholesale prices and indirect real estate asset prices in Singapore. Westerheide (2006) examined the performance and relationship of equity assets in eight advanced economies between 1990 and 2004 with other groups of real estate property assets. The results showed that returns of property shares and non-property shares were integrated.

Also, Hoesli (2007) studied the relationships between property shares, non-property and direct property assets across sixteen countries over a 15-year period. The result showed that the returns on property shares were positively related to non-property assets but were segmented from bond earnings. Liow (2010) revealed a high level of integration between that real estate securities and non-real estate equities at the local market level while equity real estate, global stocks and global real estate securities had a low convergence relationship.

Yunus (2013) found that each property stock was co-integrated with the stock market. Olaleye and Ekemode (2014) examined the integration of real estate equity and non-real estate equity. The study found that listed stock property and common stock were integrated. Similarly, Olaleye and Ekemode (2016) examined the convergence between direct and indirect property investment in Nigeria. The study showed that listed property shares outperformed direct property assets on a risk-adjusted basis.

Ntuli and Akinsomi (2017) found that though stocks outperformed REITs on the risk-adjusted return basis, REITs however, had a higher return enhancing capacity when included in a mixed asset portfolio. Ramjee (2017) found that South African listed property assets were less volatile than the overall stock market. The study found that listed property stocks behaved synonymously like the bonds and not the equity market where they are being traded. Sebate (2019) found that equities outperformed REITs on a risk-adjusted basis. However, REITs exhibited a low correlation with bonds and thus could offer some diversification benefits when combined in a portfolio of bonds. Dabara et al. (2019) found the same level of volatility in the performance of REITs and non-REITs equities. Though the non-REITs assets outperformed the REITs. Arora et al. (2019) found that economic variables such as money supply, inflation rate, GDP and exchange rate are significant predictors of REITs returns. Tiryaki and Tiryaki (2019) noted that listed assets are positively impacted in the short run by exchange rate, consumer price index and changes in industrial production. Ndunda et al. (2020) revealed that listed equities have a weak positive relationship with macroeconomic variables such as inflation rate, exchange rate and GDP. Olanrele et al. (2021) submitted that REITS performance in the short-run was significantly influenced by macroeconomic variables in the Nigerian market. Akinsomi et al. (2021) examined the linkages between BRICS-listed property stocks and REITs markets in the US, Australia and the UK. The study found evidence of cointegration between the assets. Chirchir (2021) examined the determinants of the performance of African REITs. The study found that while inflation, liquidity and interest rate do not significantly impact the performance of REITs, GDP leverage, firms' size and firms' age significantly impacted the performance of African REITs.

Contrary to the submissions of previous studies agreeing to the integration of real estate assets with equities, studies such as Geltner (1990), Ross and Zisler (1991) and Ramjee (2017) argued that indirect real estate and stock markets were largely segmented. Okunev and Wilson (1997) also established a weak nonlinear relationship between the overall stock market and the securitized real estate market using the non-linear mean stock reversion pricing model. Yang and Ye (2010) while studying the indirect real estate and common stock

return discovered that Chinese indirect real estate assets and common stock returns are not integrated. Also, Sharma and Bakshi (2019) revealed that real estate risk has a positive association with the DPR of selected real estate firms. Nguyen and Razali (2020) established that listed property stock companies in Indonesia had poor risk-adjusted performance compared to other stock companies. The study further established that Indonesian listed property companies had low correlations with bonds and stocks which suggested some levels of diversification potential for stock and bond investors.

Summarily, while most of the studies above established that the real estate and listed investment assets are integrated, a few others argued that there is a weak relationship between indirect real estate and the stock market. A few other studies, such as Yang and Ye (2010) found no relationship between indirect real estate assets and common stock. However, there are two major gaps. The first is the dearth of studies focused on African emerging markets and the other is the predominance of foreign studies concerning the subject matter. Thus, given that the behaviour of indirect real estate could be market-dependent, it is expected that studies investigating the level of integration between indirect real estate and other investment assets in an emerging market context be examined. Hence, this study seeks to answer the following research questions:

i. what is the investment performance of, and correlation between, indirect real estate and other listed investment assets in the Nigerian property market?
ii. what is the level of integration between indirect real estate and other listed investment assets in the Nigerian property market?

3.0. The Nigerian Capital Market and the Indirect Real Estate Sector

The capital market activities commenced in 1946 with the issuance of the first development stock of £300,000 by the Colonial Administration in Nigeria. Sequel to this, the Nigerian Stock Exchange came into existence in the year 1960 as Lagos Stock Exchange but started trading in 1961 with three equities, ten industrial loans and six Federal Government bonds making a total of nineteen listings. The transformation of the Lagos Stock Exchange to the Nigeria Stock Exchange (NSE) and the subsequent development of the NSE has made it an important market in Nigeria and beyond with over 200 listings and a total market capitalization of NGN28.26 trillion as of January 2020. In addition to this, the market has over the years experienced

significant foreign investments from multinationals and institutional investors among others. Without a doubt, the trading system in the NSE market has experienced tremendous transformation, especially with the removal of restrictions on capital inflows, and electronic clearing.

Consequently, given the rapid developments in the NSE market, there has been significant improvement in the real estate sector owing to the inclusion and domination by multinational and corporate shareholders. This has led to the inclusion of property assets into the capital market. This began with the listing of UACN Property Development Company in 1998, Union Homes Hybrid REITs in 2006 and Skye Shelter Fund in 2008 and UPDC REITs in 2013. The existence of these indirect real estate companies has eased the investment in indirect real estate assets as investors do not need a huge capital to invest in indirect real estate assets.

Thus, investment in the indirect real estate assets in the Nigeria investment market is an investment in Listed Property Stock (LPS) and/or Real Estate Investment Trusts (REITs). While LPS consists of only UACN Property Development Company, the REITs are made up of 3 companies; Skye Shelter Fund, Union Homes hybrid REITs and UPDC REITs. These indirect real estate assets have a total market capitalization of NGN39.63billion (Union Homes Hybrid REITs - NGN9.15billion, Skye Shelter Fund - NGN1.54billion, UPDC REITs - NGN10.01 and UACN Property Development Company - NGN18.93) as of May 2022. These indirect real estate companies pool resources from corporate/institutional, multinationals and individual investors through initial public offerings, and sales of shares and invest the same into direct real estate assets through the acquisition and development of properties in prime locations across the country. The predominant form of investment is the commercial and residential properties for medium and high-income earners.

4.0. Data and Methodology

The study utilized secondary data for the study, this comprises the average quarterly share prices of the indirect real estate assets and the five sectoral indexes of the Nigeria Stock Exchange (NSE). These data were obtained from the daily price list of the NSE, covering Q1 of 2009 to Q4 of 2020. Quarterly opening and closing prices of the listed assets were employed in determining the quarterly mean return and risk of the investment assets

To evaluate the assets performance in terms of return and risk during the period under study,

holding period return and standard deviation were employed.
While the holding period is given as:

$$Hpr = \frac{I_n + (P_{n+1} - P_n)}{P_n} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where HPr is the holding period return, Pn is the price of share/ capital value of the asset at the beginning, Pn+1 is the price of share/capital value of the asset at the end, and In is the dividend of share/ income of asset received during the holding period.

The standard deviation which measures the deviation of the asset's quarterly returns was used to determine the risk level of the investment assets. The standard deviation is given as:

$$SD = \sqrt{\sum_{i}^{n} \frac{\sum_{i=0}^{n}(x_i - \bar{x})^2}{n}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where SD is the standard deviation based on the quarterly series of returns, is mean return, xi is the individual observation, and n is the number of observations.

The return-risk ratio and correlation among the asset pairs were also analysed. Given that the individual results obtained from the return and risk analyses might not present a holistic guide towards determining an individual asset's performance, the return-risk ratio presents a clearer basis for assessing the performance of the assets. The decision rule is that the higher the return risk ratio, the better the performance of the asset, and vice-versa. The correlation analysis gives an insight into the possibility of co-movements between the pair of assets. This preliminary analysis was further investigated/validated using the cointegration analysis.

Thus, having obtained and analysed the data on the average quarterly returns of the indirect real estate asset and the five major sectorial indexes of the NSE making use of holding period return, standard deviation, return risk ratio and the correlation analysis, the study further tested for the level of integration of the investment asset classes.

To test for the level of integration, at first, the Augmented Dickey-Fuller (ADF) test was employed to determine the unit root. The testing procedure for the ADF test is presented in the model:

$$\Delta yt = \alpha + \beta t + \gamma yt - 1 + \delta 1 \Delta yt - 1 + \square + \delta p - 1 \Delta yt - p + 1 + \varepsilon t \ldots\ldots\ldots\ldots\ldots (3)$$

where α is a constant, β is the coefficient on a time trend and p is the lag order of the autoregressive process.

Also, this test is used to determine if the investment returns were stationary or non-stationary. To determine the stationarity of the data series, two hypotheses were set:

H0 = The data series (investment returns) are non-stationary (has unit root)
H1 = The data series (investment returns) are stationary (has no unit root)

The critical value was set at 5%. After the unit root test had been conducted, the Akaike information criterion (AIC) and Schwartz information criterion (SIC) were used to determine the order of the variables. The Akaike information criterion (AIC) and Schwartz information criterion (SIC) are given as thus:

AIC = T In (residual sum of squares) + 2n ..... (4)
SIC = T In (residual sum of squares) + n In (T) ..... (5)

Where n is the number of parameters estimated and T is the number of usable observations.
The least of the lags was subsequently used for the analysis of the cointegration (Johansen Cointegration) test, in determining the existence or otherwise of a long-run relationship between listed real estate assets and other investment assets. The data series were found to be stationary at the first difference. The study adopted trace statistics in carrying out the Johansen co-integration and the outcomes were ranked. By ranking, the co-integration analysis showed different levels of co-integration relations. Thus, the rank (r) of zero implies no co-integration relationship. A rank is one implies one co-integration relationship and so on. This is mathematically denoted as r = k, where r is the rank and k is a constant.

Furthermore, to determine the integration between the returns of real estate assets and other listed investment assets, a hypothesis was developed and this is given as:
H0 = There is no co-integration between listed real estate and other listed assets.
H1 = There is co-integration between listed real estate and other listed assets.

5.0. Analysis and Results

The results of the analysis are presented in two sub-sections. The first sub-section reports the results of the descriptive statistics of the assets' quarterly returns and the correlation analysis between the pairs of assets. The results of the co-integration analysis are reported in the

second sub-section.

5.1. Descriptive Statistics and Correlation Analysis of Assets Returns

An examination of the descriptive analysis as presented in Table 1 shows that indirect real estate outperformed most other assets on a mean return basis. Where indirect real estate had a mean return of 4.84, NSE insurance was the least performing asset with a mean return of -2.91. the results also showed that while NSE banking and NSE Oil and Gas has positive mean returns of 1.23 and 0.09 respectively, NSE Consumer and NSE industrial had negative mean returns of -0.01 and -2.50 respectively.

The results of the assets risk level as measured by the standard deviation showed that the least risky of the assets were NSE Industrial, and NSE Consumer, followed by indirect real estate. These have standard deviation values of 2.45, 3.43 and 5.10 respectively. The findings showed that NSE Banking was the riskiest of the assets with a standard deviation value of 14.28. NSE Oil and Gas and NSE insurance have respective mean values of 13.29 and 10.51.

Table 1. Descriptive and Correlation Analysis of Assets Returns

	Descriptive Statistics					Correlation Analysis					
			Return/Risk				NSE	NSE	NSE	NSE	NSE
Asset Classes	Mean	S.D	Ratio	Max	Mini	IRE	Banking	Consumer	Industrial	Oil & Gas	Insurance
IRE	4.84(1)	5.10(3)	0.95(1)	9.26	0.72	1.000	-0.313	0.652	-0.648	0.136	0.245
NSE Banking	1.23(2)	14.28(6)	0.09(2)	19.94	-8.79		1.000	-0.011	0.046	0.242	0.151
NSE Consumer	-0.01(4)	3.34(2)	0.00(4)	3.41	-1.69			1.000	-0.563	-0.005	0.386
NSE Industrial	-2.50(5)	2.45(1)	-1.02(6)	3.21	-31.80				1.000	-0.263	-0.166
NSE Oil & Gas	0.09(3)	13.29(5)	0.01(3)	14.22	-12.08					1.000	0.228
NSE Insurance	-2.91(6)	10.51(4)	-0.28(5)	6.77	-17.49						1.000

* rank of assets is shown in parenthesis

A clearer performance of the assets as given by the return risk ratio showed that indirect real estate outperformed other assets with a return risk ratio of 0.95. this is followed by NSE banking (0.09) and NSE Oil and Gas (0.01). While NSE Consumer had a return risk ratio of 0.00, the two least performing assets were NSE Insurance (-0.28) and NSE Industrial (-1.02).

The result suggests that indirect real estate assets outperformed other listed investment assets for the period under study. This result corresponds to the result of the study by Chen and Mills (2006) which established that equity real estate asset yields a high rate of return than other listed investment assets. Similarly, Hoesli and Lekander (2008) and Rahmann and Woolston (2011) also established in their various studies that indirect real estate return was higher than other listed stock returns. Likewise, Olaleye and Ekemode (2014) established that real estate equity assets outperformed non-real estate equity based on returns. The results

however contradict the findings of Ayodele et al. (2016) which found that indirect real estate underperformed investment assets in the Nigerian property market based on returns and return-risk ratio.

The result of the correlation analysis shows that indirect real estate had a negative correlation with NSE Banking (r = -0.313), and NSE Industrial (r = -0.648). This implies that there is a possibility of an inverse relationship which should encourage diversification benefits. The results also show that indirect real estate had a positive relationship with other listed assets; NSE Consumer (r = 0.652), NSE Oil and Gas (r = 0.136), and NSE Insurance (r = 0.245). This positive relationship suggests the existence of a co-movement between the pair of assets. As such, combining these pairs of assets in a mixed-asset portfolio might be expected to yield diversification benefits. However, while the correlation analysis presents only an indicative response of the co-movements, there is a need to analyse the level of integration of indirect real estate assets with other listed investment assets. The results are presented in the subsequent sections.

5.2. The Integration of Real Estate Assets and Other Listed Investment Assets

As earlier stated, to determine the integration of indirect real estate assets and the other listed investment assets, the Johansen Co-integration test was used. However, before using the Johansen Co-integration test the Unit Root Test was used as a pre-estimation test to determine whether the data were stationary or non-stationary. The results of the Unit Root Test are presented in Table 2.

Table 2 - Unit Root Test Using ADF Test

Variable	At Level	First Difference	Critical Value (5%)	Remarks
NSE Consumer	-1.308189	-6.262662	-2.926622	First-order integration
NSE Banking	-2.068274	-6.310065	-2.928142	First-order integration
NSE Oli and Gas	-1.653544	-6.396407	-2.926622	First-order integration
NSE Insurance	-1.41772	-5.325452	-2.926622	First-order integration
NSE Industrial	-2.851243	-8.084358	-2.928142	First-order integration
IRE	-0.724411	- 4.049911	-2.933158	First-order integration

5.3. Result of the Unit Root Test

The test was carried out using the Augmented Dickey-Fuller (ADF) test procedure. The optimal lag was selected using the AIC information criteria. The ADF test value as shown in Table 2 reveals that the test values (-1.308, -2.068, -1.654, -1.418, -2.851, -0.724) for NSE Consumer, NSE Banking, NSE Oli and Gas, NSE Insurance, NSE Industrial and IRE respectively were greater than there corresponding critical values (-2.927, -2.928, -2.927, -2.926, -2.928, -2.933) at 5%.

This implies that all the variables were not stationary at level and as such, the data series had no unit roots. Subsequently, the data series were subjected to further differencing. At first difference (Table 2), it was found that all the variable test values (-6.263, -6.310, -6.396, -5.325, -8.084 and – 4.050) for NSE Consumer, NSE Banking, NSE Oli and Gas, NSE Insurance, NSE Industrial and IRE were lesser than their corresponding critical values (-2.927, -2.928, -2.927, -2.926, -2.928, -2.933) of first-order of integration and this implies that the variables were stationary at first difference as such the data series had a unit root. More so, the variables were of the same order and this informed the test of co-integration using the Johansen co-integration test.

5.4. Johansen Cointegrating Test

The result of the unit root test shows that the variables are stationary at first difference; therefore, it becomes necessary to determine the long-run relationship among the variables. Cointegration is said to exist when a group of variables are individually integrated and are of the same order, as such, they have at least one linear combination (Lee et al., 1993). Cointegration explains the existence of a long-run relationship between variables. One major technique of measuring cointegration is Johansen's cointegration technique (Utkulu, 1994), and it has been considered to be advantageous over other techniques because of its ability to estimate more than one cointegration (Khalifa and Sakka, 2004). Thus, the Johansen co-integration was adopted in investigating the level of integration between the indirect real estate assets and the other listed investment assets such as NSE Banking, NSE Consumer, NSE Industrial, NSE oil and gas and NSE Insurance sector, having discovered that the variables were not stationary at level. The study adopts Trace test statistics to analyze the Johansen co-integration test. The outcomes are presented in Table 3.

The result showed that at rank = 0, the value of the Trace statistics was 136.52 with a corresponding critical value at a 5% significance level of 95.75. Since the critical value was lower than the Trace Statistic value at the 5% level, the null hypothesis of no co-integration was rejected. This suggested that there was a co-integration or long-run relationship between the indirect real estate assets and other listed investment assets. The result also suggests that both the real estate assets and the other listed investment assets comove in the long run. The findings imply both react to the same market factors and most often moved in the same direction for long-run convergence. Hence, no diversification benefit when the assets are combined in a mixed-asset portfolio

Table 3: Trace Statistics Test

Unrestricted Cointegration Rank Test

Variables: IRE, NSE INDUSTRIAL, NSE INSURANCE, NSE OIL AND GAS, NSE BANKING AND NSE CONSUMER			
Hypothesized No. of CE(s) for Trace Statistic	Trace Statistic	0.05 Critical Value	Prob.**
None * R=0	136.5154	95.75366	0.0000
At most 1 *R=1	89.33693	69.81889	0.0007
At most 2 * R=2	56.04027	47.85613	0.0071
At most 3 * R=3	33.32248	29.79707	0.0188
At most 4* R=4	19.76068	15.49471	0.0107
At most 5* R=5	6.925179	3.841466	0.0085
** denotes rejection of the hypothesis at the 0.05 level*			
***MacKinnon-Haug-Michelis (1999) p-values*			
Trace test indicates 6 co-integrating equations at the 0.05 level			

Also, at rank = 1, the table 3 shows that the Trace Statistics value of 89.34 was greater than its corresponding critical value at a 5 per cent significant level of 69.82. The result indicates that there was co-integration between indirect real estate assets and other listed investment assets. This means that the indirect real estate asset just like the result above is co-integrated with other listed investment assets. It means that indirect real estate assets and other listed investments have a long-run relationship and as such, the assets comove and react to the same market fundamentals. The result is similar to the result in r = 2 in which the Trace Statistic of 56.04 was higher than its corresponding critical value of 47.86.

In rank 3 and rank 4 the Trace Statistic values in rank 3 and 4 were 33.32 and 19.76 respectively which were greater than their corresponding critical values of 29.80 and 15.50 respectively. It means that indirect real estate asset was co-integrated with other listed investment assets and as such, the assets have similar behaviours to market factors. The result is similar to what was obtainable in rank 5 as the Trace Statistics value of 6.93 was greater than its corresponding critical value of 3.84.

The above results, therefore, mean that indirect real estate assets and other listed investment

assets are highly integrated. In other words, there is an existence of a long-run relationship between indirect real estate assets and other listed investment assets. Furthermore, the results indicate that indirect real estate assets behaved more like the five sectorial index assets considered. This further implies that little or no diversification benefits could be obtained when an indirect real estate asset is combined with other listed investment assets in a portfolio. This result correlates with studies like Liu, Hartzell, Greig and Grisson (1990) which established that the stock market was integrated with the securitized property market in the US. Furthermore, Glascock, Lu and So (2000) established that REITs and listed stocks were integrated and had similar behaviour. Also, Liow (2010) revealed a high level of integration between real estate securities and non-real estate equities. Similarly, Olaleye and Ekemode (2014) found out that real estate equity was integrated with common stock otherwise known as non-real estate equity.

6.0. Conclusion

The study determined the performance and level of integration of indirect real estate assets and other listed investment assets. Results based on the return-risk analysis showed that indirect real estate assets outperformed other listed investment assets, indirect real estate also showed a strong positive correlation with most of the misted assets, suggesting the potential for minimal diversification benefits. Further analysis to test for the level of integration using the Johansen Cointegration Test showed that the indirect real estate asset and other listed investment assets are highly integrated. This means that the indirect real estate asset and other listed investment assets comove in the long run which indicates that the combination of these assets in an investment portfolio will bring little or no diversification benefit. The results corroborate the findings of extant studies establishing co-movements between indirect real estate assets and other listed assets. The foregoing suggests that indirect real estate behaves synonymously like the stock market where it is being traded and not like the underlying physical properties being traded. It might thus be expected that investment characteristics for which the direct real estate asset is known might not be readily admissible as investment characteristics of the indirect real estate assets. Hence, the diversification attributes of real estate assets might need to be examined from the perspective of the investment asset, that is, whether direct or indirect real estate assets.

On this note, the finding in this study has implications for the investors and other participants in the Nigerian investment market. The study, therefore, recommends that investors should

not consider the combination of indirect real estate and other listed investment assets in an investment portfolio as the assets have little or no long-run diversification benefit. This means that none of the other listed investment assets could be a close substitute for indirect real estate assets when affected by market fundamentals. This result implies that combining the indirect real estate and the other listed investment assets in a portfolio mars the investor's motive of maximizing profit in the long run.

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FEMALE STUDENTS' CARRIER CHOICES: HOW GENDERED ROLE AFFECTS WOMEN'S PARTICIPATION IN NIGERIAN REAL ESTATE PROFESSION

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Abstract

A career decision is a critical task, often impacted by events and circumstances rather than the training the students receive in school. Female graduates in the built environment are frequently conservative in their career choices in the real estate industry; as a result, women are underrepresented. This study employs quantitative and qualitative research designs to explore how graduating female real estate students' experiences influence their long-term career choices and how their choices affect women's participation in Nigeria's real estate profession. A survey of graduating female real estate students from two universities and two polytechnics in South-west Nigeria was used to collect quantitative data for the study. Qualitative data was gathered through interviews with recent female real estate graduates. The analysis presents the study's findings on students' motivation for pursuing a real estate degree, challenges encountered in real estate education, perceptions of the real estate practice environment, and how these experiences influence their long-term career choices. The study concludes that the real estate practice environment is unappealing to female graduates. Hence, there is a need for concerted efforts toward attracting and retaining female graduates in the real estate profession to support the industry's business development and growth.

Keywords: Attracting and retaining women in real estate, Career decision, Gender stratification, Real estate education, Real estate practice environment.

1.0. Introduction

Gender inequality in the workplace is a crucial source of concern and has sparked an intense public debate in many domains. The real estate industry contributes significantly to a country's overall economy and is critical to the valuation, agency, management, and construction industries (Warren and Antoniades, 2016). Real estate is a significant employer of labour and a well-known industry worldwide. However, research indicates bias and discrimination against women in the real estate profession, resulting in women being underrepresented in the profession (see, Oladapo, 2017; Jimoh et al., 2016; Azhar et al., 2014; Lietz, 2012). The real estate industry's male-dominated character has remained constant throughout time (Pauli, 2013).

The public and private sectors have tried to address the gender gap, and several countries have made little progress. According to Polgar (2014), women brokers account for 57 per cent of the residential real estate market in the United States; however, this success story has yet to be reproduced in other profitable sectors such as commercial and development sectors (McCormick, 2014). Hirigoyen (2014) found that women account for 11% of the UK's real estate practitioners, indicating that their level of participation is increasing. Women dominated Malaysia's real estate profession in 2009, according to data from the country's Department of Statistics (DOS). The percentage of women involved in Malaysian real estate is 5.9 per cent, somewhat higher than the 5.3 per cent stated for males (DOS, 2012). Mhlange (2015) emphasised the significant achievements of South African women in the real estate profession. Despite accounting for 48% of the labour force in Nigeria (World Bank, 2022), women remain underrepresented in Nigeria's real estate industry (Obih, 2014). The membership records of the Estate Registration Board of Nigeria (ESVARBON) and the Nigeria Institution of Estate Surveyors and Valuers (NIESV) revealed 20 - 25 per cent female participation in the estate management profession in Nigeria (see, Omogor et al., 2015; Odudu, 2014).

There are several reasons for women's underrepresentation in the workforce. Cultural values, institutional and societal standards, expectations and prejudices about how men and women should act in society were all underlined by Yukongdi and Benson (2006). According to Sewalk and Netfield (2013), recruiting females in the sector is influenced by industrial traditions, organisational cultures, and sexist ideas. Female employees are thus employed in administrative or secretarial tasks rather than their core profession (Adogbo et al., 2015). These factors may lead to women's discontent and underutilisation. Women frequently leave

such settings and move on to other sectors, resulting in their underrepresentation in the real estate industry.

Male dominance in real estate student enrolment and graduation in tertiary institutions has been similarly validated by research in real estate education (see, Chiwuzie et al., 2021; Ayodele, 2018; Ayodele et al., 2017). Despite this, the number of female students enrolling and graduating from tertiary institutions' real estate education programmes has steadily increased. However, this increase is not reflected in the workforce (Fernando et al., 2014). The difference between the number of women graduating from higher institutions and those working in the real estate industry shows that female real estate students consider alternative career options after graduation. A career decision is a critical task, often impacted by events, circumstances and challenges rather than the training the students receive in school. The challenges that female students face during their undergraduate education have been broadly classified as internal and external barriers (Ling Yean Yng and Pei Poh, 2004) to a career decision. It has been suggested that the "…. gap in career choice may be caused by gender role perceptions among people" (Phathara-on et al., 2016, p17). This study explores how graduating female real estate students' experiences influence their long-term career choices and how their choices affect women's participation in Nigeria's real estate profession. The study examines female students' motivation for pursuing a real estate degree, challenges encountered in real estate education, perceptions of the real estate practice environment, and how these experiences influence their long-term career choices.

2.0. Literature Review

2.1. Motivations for real estate education

Making a career choice is a complicated process that impacts many elements of a person's life (Hall, 1996). Selecting a career is critical for people's working lives and is often decided in a person's final year in secondary school (Madikizela and Haupt, 2010). According to Bigelow et al. (2016), high school students typically struggle with career choices, and more than 80% of students in higher education believe they selected their profession too soon. Some of these students even claimed that if given a chance, they would change their careers. Choosing a professional path is a significant problem for graduates since it will have long-term consequences (Ayodele, 2018). The factors that motivate students to seek careers often influence their choices (Agarwala, 2008; Chileshe and Haupt, 2010). Several studies have

revealed various factors that motivate female students to pursue careers within the real estate industry. Among them are school counsellors and teachers (OstadaliMakhmalbaf, 2014; Santrock) (2005). Parents, family members, friends, role models, peers and gender influence (OstadaliMakhmalbaf, 2014; Maina, 2013), having a family member in the industry, a mentor, job opportunities available after graduation (Bigelow et al., 2016), industry experience (Bigelow et al., 2016; Koch, 2009), career exposure from professional organisations and financial considerations (Ghani et al., 2008).

Empirical studies on the impact of the motivating factor yield conflicting results. According to Odia and Ogiedu (2013), career prospects and good salaries were primary influencing factors. In Maina (2013), role models had the most significant impact on student's career choices, followed by peers and gender influence, while the students' families had the most negligible influence on their career decisions. According to Pablo-Lerchundi et al. (2015), parental and familial influences significantly impact students' career decisions. Korir and Wafula (2012) reported that career prospects and contextual variables influenced most students' career choices, while personal considerations had less impact. Ng et al. (2017) found that students' exposure to career-related information through professional organisations, role models, practitioners and lecturers are significant factors in determining their career choices. According to Moraba and Babatunde (2019), the availability of work opportunities, prospective financial stability, the industry's image, and the influence of mentors, the media, and family members were all critical factors in graduating female students' choice of a career. Gambo et al. (2012) submitted that several estate management students wandered into the course due to a course change during the institution's admission process. Gambo et al.'s study further found that peer influence, prior work experience, family influence, and early school counselling were the least motivating factors for real estate education.

2.2. Career challenges faced by females in real estate education

According to Dainty et al. (2000), a woman's career plan is influenced by personal characteristics, life circumstances, abilities, and perceptions about the industry and working conditions. Female undergraduate students identified challenges that Ling Yean Yng and Pei Poh (2004) classified as internal and external barriers. According to Moroba and Babatunde (2019), internal barriers refer to the challenges that female students experience in their education. In contrast, external barriers allude to challenges that have persisted in the industry for many generations but over which female students have no influence (Ling Yean Yng and Pei Poh, 2004). Ling Yean Yng and Pei Poh identified the perceived nature of the

property industry, working circumstances and sexist attitudes as external hurdles graduating female students face in the property industry. Table 1 depicts the various challenges that have been identified in previous studies.

Table 1 Internal and external barriers to career choice and Authors

Career barriers	Authors
Internal barriers	
Male-Dominated faculty staff and lecturers	Adogbo et al. (2015); Shane et al. (2012)
Lack of Networking opportunities	Bigelow et al. (2017), Shane et al. (2012)
Male students do not readily accept female students	Ling Yean Yng and Pei Poh (2004).
Female students face gender-based harassment.	Francis and Prosser (2014), Madikizela and Haupt (2010).
Male culture exists in the classroom	Ling Yean Yng and Pei Poh (2004).
Discrimination against female students	Francis and Prosser (2014), Madikizela and Haupt (2010)
External barriers	
Male-dominated cultures in the industry	Ginige et al. (2013), Sewalk and Neitfeld (2013), Worrall et al. (2010), Madikizela & Haupt (2010).
Gender stereotyping in the industry	Astor et al. (2017).
Women face a glass ceiling.	Astor et al. (2017), Ling et al. (2014)
Isolation, lack of role models and mentors in the industry	Francis (2017), Agherdien and Smallwood (2013), Winn (2004).
Long and inflexible working hours	Barreto et al. (2017). Astor et al. (2017), Ling et al. (2014), Worrall et al. (2010), Winn (2004).
The difficulty of balancing work and family responsibilities	Barreto et al. (2017), Ling et al. (2014), Winn (2004).
The industry has a poor image as "dirty."	Fielden et al. (2000).
Sexual harassment	Karim and Tumin (2009), Mattis (2004), Dainty et al. (2000).

2.3. Challenges faced by professional women in real estate

Women are routinely denied professional advancement due to institutional and cultural barriers, particularly in the real estate business (Caven, 2006). The significant difficulties that women must overcome are the sexist attitudes that include gender stereotypes and the glass ceiling in the workplace (Astor et al., 2017). According to Mattis (2004), stereotypes and misperceptions about women's abilities, long-term commitment to business careers, exclusion from informal networks and channels of communication, lack of access to mentors, managers' unwillingness to "risk" placing women in important development assignments, salary disparities and sexual harassment are all barriers to professional women's

advancement. Ling et al. (2014) observed that the primary causes of poor female participation in the real estate business include inflexible work schedules and a lack of infrastructure that allows women to return to the profession after taking time off to care for family commitments. Dainty et al. (2000) posited that harassment and bullying are just two of the overt and covert types of prejudice directed against women.

In Kaduna, Nigeria, Ishaya et al. (2011) studied the barriers women experience in the real estate profession. The perception that women are incapable of practising the profession, women surveyors are considered lazy and inept, managing job and family duties, needing to work fewer hours owing to household obligations, and a distaste for travelling were among the challenges they discovered. Oluwunmi et al. (2017) discovered that female estate surveyors and valuers in Lagos, Nigeria, struggle to manage work and family life. Women are considered incapable of practising the profession due to their failure to meet the essential requirements, which include frequent travel due to home commitments, which their male counterparts perform efficiently. Furthermore, female estate surveyors and valuers reported that sexual harassment was the least challenging aspect of their work.

Women's professional challenges are not exclusive to the real estate industry. Punnett (2016) revealed that women in the workplace suffer gender-based challenges worldwide. Women have historically been marginalised and excluded as a group, and as a result, women face prejudice and discrimination, including sexual harassment, particularly in male-dominated workplaces (Joseph et al., 2021). Zwiech (2009) recognised several sorts of discrimination against women, including employment, professional, position, access to training, and wage discrimination. According to studies from many sectors, including health (Joseph et al., 2021; Aberg et al., 2017) and construction (Akinlolu and Haupt, 2020; Moroba and Babatunde, 2019), work experience for most professional women is challenging due to the presence of bias and discrimination against women. Several studies have examined the experience of gendered cultures and the gender inclusion of students in male-dominated workplaces (Alves and English, 2018; Male et al., 2017). These research findings demonstrated that students reported experiences congruent with gendered cultures; there was the marginalisation of women, or stereotypically feminine practises or qualities) and the privilege of stereotypically male practices or features.

3.0. Methodology

This study employed quantitative and qualitative research designs. The study's target group comprises graduating female estate management students and recent female real estate graduates working in professional real estate firms. The graduating female students were drawn from two South-western Nigerian universities (Obafemi Awolowo University, Ile-Ife, and the University of Lagos, Akoka) and two Polytechnics (Federal Polytechnic Ede and Yaba College of Technology, Yaba). The final year female students in these four institutions were 500-level students in the Universities and the Higher National Diploma (HND) II students in the Polytechnics. These categories were chosen because they are currently at the exit stage and have a greater understanding of the scope and nature of real estate education and training. The study's quantitative data was collected through online and self-administered questionnaires. Convenience sampling was used to select 41 graduating female real estate students from all four institutions. Furthermore, employing convenience and snowball sampling, qualitative information was gathered from interviews with five recent female real estate graduates working in professional real estate firms.

In developing the questionnaire, factors influencing career choices and career barriers were drawn from the literature. The identified variables were organised into three themes: reasons for pursuing a real estate degree (motivating factors), difficulties encountered during real estate education (internal barriers), and perceptions of the real estate practice environment (external barriers). The students were asked to rate individual factors using a five-point Likert scale. The ratings ranged from 1 (strongly disagreed) to 5 (strongly agreed). The mean rating and standard deviation were used to rank the various responses. The level of significance of each response to a specific factor was determined. Other studies (Lan 2019, Ayodele 2018, Chileshe and Kikwasi 2014) utilise a benchmark of 3.00 (the neutral point on a 5-point scale) to assess the significance of mean-rated items/factors. Items with mean scores higher than 3.00 were significant and impactful, but those with mean scores lower than 3.00 were not. The Cronbach's alpha test was used to examine the internal consistency and reliability of the scales used in this study. The findings demonstrate that the scales as a whole have good reliability.

4.0. Discussion of Results

This section contains a discussion of the study's findings. The findings are organised and discussed following the study's objectives. Tables 2–4 show female students' motivation for studying real estate, problems experienced in real estate education (internal barriers), and perceptions of the real estate practice environment (external barriers). The comments from the interviews with female graduates are cited in-text to help explain the study's findings. Finally, the impact of female graduates' experiences and career choices on women's participation in Nigeria's real estate profession was highlighted.

Table 2 Female students' motivation for pursuing a real estate degree

Motivating factors	Mean score	SD	Remark
Financial prospects	3.49	1.07	Significant
Career opportunities available	3.68	1.03	Significant
Family and friends influence	2.88	2.11	Not Significant
Media	2.82	2.88	Not Significant
Role models or mentors	2.65	2.43	Not Significant
Teacher and career counsellors	2.60	1.86	Not Significant
Having a parent in the industry	2.49	2.32	Not Significant
Previous experiences in the real estate profession	2.46	2.36	Not Significant

According to Table 2, the financial prospects that come with real estate practice (mean = 3.49) and the career opportunities open to graduating students (3.68) after graduation were the significant motivations for their decision to study real estate. This outcome collaborated with the findings of Ogiedu (2013) and Wafula (2012). On the other hand, the influences of family, friends, the media, role models, mentors, teachers, career counsellors, having a parent in the business, and previous real estate experience were not significant motivators for real estate education. Although this conclusion contradicts those of Moraba and Babatunde (2019), Ng et al. (2017) and Pablo-Lerchundi et al. (2015), the standard deviation of responses suggests that these factors did apply to some of the graduating female students. This finding suggests a paucity of information on real estate careers in the public domain. By revealing that some students had no prior knowledge of estate management as a course of study, the interview responses support Gambo et al. (2012)'s assertion that some Nigerian real estate students slid into the course due to a change in the course during admission by the university. During the interview, the female graduates said:

"I applied for mechanical engineering but was offered Estate Management, I accepted the offer since I did not want to waste another year in waiting." (Female graduate 1, 2020).

"A family friend suggested I study estate planning. Despite not knowing anything about the course, I enrolled since I was informed that I would have no trouble finding work and could even work on my own. So far, I have enjoyed the course, and I have encouraged my younger brother to pursue a career in estate management" (Female graduate 2, 2020).

Table 3 Challenges encountered by female students in real estate education

Internal barriers	Mean score	SD	Remark
Male-Dominated faculty staff and lecturers	4.24	0.73	Significant
Lack of Networking opportunities	3.78	0.98	Significant
Male students do not readily accept female students	3.52	1.06	Significant
Female students face gender-based harassment in real estate education	3.48	1.87	Significant
Male culture exists in real estate education	3.42	2.13	Significant
Discrimination against female students	3.36	2.09	Significant

Table 3 shows the average mean scores and standard deviation for the challenges encountered by female students in real estate training. Each of the six internal barriers had a mean score higher than 3, suggesting that they significantly influenced the students' real estate education. Previous studies (Barreto et al., 2017; Adogbo et al., 2015; Francis and Prosser, 2014) have placed each element as a significant barrier. The considerably large standard deviations clearly show the high degree of variance in responses among the students. This variation suggests that the students have faced several challenges relating to internal barriers. These experiences are likely to influence female students' career choices after graduation. The female graduates had these to say:

"The challenge I had in my estate management study was the lack of a female lecturer I could confide in. There were occasions when I needed to talk to a senior female regarding academic or personal matters. All of the staff were men, and I was concerned that they may take advantage of me while offering such support" (Female graduate 1, 2020).

"During my undergraduate studies, my class was male-dominated, with

female students being made to feel less capable or being undermined. It was difficult for me since sexist and negative attitudes tend to impair one's self-esteem and confidence" (Female graduate 2, 2020).

"I had no female mentors to support me and no networking opportunity for me to receive adequate career guidance" (Female graduate 4, 2020).

Table 4 Female students' perceptions of the real estate practice environment

External barriers	Mean score	SD	Remark
Male cultures exist in real estate practice	3.80	1.04	Significant
Gender stereotyping occurs in real estate practice	3.71	1.21	Significant
Female graduating students face a glass ceiling	3.64	1.09	Significant
Lack of role models and mentors in the industry	3.54	1.56	Significant
Real estate practice has long and inflexible working hours	3.47	2.06	Significant
Real estate practice occurs at the expense of family responsibilities	3.34	2.13	Significant
The real estate practice has a poor image	2.91	1.94	Not significant
Sexual harassment	2.87	2.32	Not Significant
Real estate practice is masculine	1.76	1.03	Not significant

Table 4 shows the results of the nine perceived external barriers female graduates face in the real estate practice environment. Three barriers have mean scores less than three, while six have mean ratings higher than three. According to these data, the six significant barriers prevent graduating female students from entering the real estate sector. These factors have also been identified in the literature as the most significant challenges confronting women in the property industry (see, Barreto et al., 2017; Adogbo et al., 2015; Francis and Prosser, 2014). Three non-significant impediments identified include real estate practice has a poor image (mean score = 2.91), sexual harassment (mean score = 2.87), and t real estate is masculine (mean score = 1.76). Below are the interview responses on the challenges faced by female graduates in real estate practice. In female graduates' words:

"..... I went to an estate firm looking for a job last year, but I was informed the firm only wanted a male candidate." My friend had a similar experience. I believe estate surveyors and valuers prefer hiring male surveyors to female surveyors, which is sad" (Female graduates in 2020).

"I have suffered prejudice based on the responsibilities allocated to me. Males are allocated more professionally inclined occupations with

higher pay levels than females. I have had clients insist on a male estate agent or estate surveyor and valuer. I was irritated since I could perform the work and it is only a matter of time before I take another career path" (Female graduate 2, 2020).

"Women still have a long way to go in real estate practises. Principal partners and clients have reservations about women's professional capabilities. Women are not always afforded the same chances as men. This explains why females engaged in estate businesses seldom undertake core practise but instead perform secretarial responsibilities, which is disheartening" (Female graduate 3, 2020).

"The issue for me is that I don't have any female real estate mentors. This has been a challenge for me since I was in school. You see and hear about women are successful in the field, but you do not have access to them, and there is no platform to motivate and encourage young females to pursue career in real estate industry" (Female graduate 4, 2020).

"The real estate profession is male-dominated, and I believe this is due to the nature of the work. Long working hours, including weekends, are frequently required in real estate profession. Combining professional requirements with family commitments is difficult for me as a married woman" (Female graduate 5, 2020).

4.1. Female students' experiences, career choices and women's participation in Nigeria's real estate profession

Finally, female graduating students were asked if they planned to work in professional real estate firms after graduation. The results show that 63.4 per cent of female graduating students surveyed affirmed interest in working in real estate firms. In comparison, 26.8 per cent preferred to choose other sectors, while 9.8 per cent were uncertain about their carrier path. This result suggests that most graduating female students are interested in a career in real estate. This passion, however, appears to be stifled because it does not reflect in the Nigerian real estate industry (which has a low female participation rate), meaning that female real estate students pursue alternate career routes after graduation. Chileshe and Haupt (2010) and Agarwala (2008) posited that students' career decisions are influenced by the factors that motivate them to choose a career. Analysis of the motivating factors in this study revealed that the career opportunities accessible to graduating female students after graduation and the financial prospects that come with real estate practice were the significant

factors that motivated them to study real estate.

However, it appears that graduating female students build their career trajectories based on their previous experiences and perceptions of the real estate practice environment. The description of the experiences of graduating female students in Table 3 demonstrates the existence of gender male culture and gender-based discrimination and that female student had to deal with these challenges while pursuing a real estate education. Graduating female real estate students reported not having mentors and networking opportunities as challenges. Naturally, these experiences would have impacted the perceptions of graduating female students about the real estate profession, as seen in Table 4. Once again, it is perceived that male culture, gender stereotyping and lack of role models and mentors impede women from entering the real estate profession. These findings appear to imply that the perceived gender stratification in the real estate industry is to be blamed for female graduates being conservative in their career choices in the real estate sector, resulting in women's low participation in Nigeria's real estate profession. Furthermore, Bigelow et al. (2018) noted that while deciding on a career path, people usually choose to follow in the footsteps of someone they like. This study's findings imply that there is a gap in this area. Female real estate students and graduates expressed a lack of exposure to persons (female professionals) they look up to, which is disappointing and worrisome. Meanwhile, it is worth noting that the real estate profession's perceived image is not a significant barrier to female entrants. Also, "sexual harassment" and "real estate practise is masculine" have the two lowest mean scores. This result suggests that some female students did not see these barriers hindering women's participation in the Nigerian real estate profession. It is heartening to see these barriers at the bottom of the list; it relieves strain for female students hoping to pursue a long-term career in the real estate industry.

5.0. Conclusion And Implication

This study examined female students' motivation for pursuing a real estate degree, challenges encountered in real estate education, and perceptions of the real estate practice environment with a view to determining how graduating female real estate students' long-term career choices affect women's participation in Nigeria's real estate profession. According to the findings, the significant factors that motivated graduating students to study real estate were the career opportunities open to them after graduation and the financial prospects of real estate practice. Besides, graduating female students faced several challenges, including male

culture, gender-based discrimination, and a lack of mentors and networking opportunities. In terms of perceptions of the real estate practice environment, graduating female students cited masculine culture, gender stereotyping, and a lack of role models and mentors as barriers to women's participation in the real estate profession.

Furthermore, the findings revealed that most (63.4 per cent) of graduating female students surveyed in this study were interested in working in the real estate industry. However, the low level of female participation in the Nigerian real estate profession shows that female real estate students seek alternative career paths after graduation. It indicates that female graduates' career paths are shaped by their experiences and perceptions of the real estate practice environment. The gender stratification within the real estate sector makes the real estate practice environment unappealing to female graduates. Gender stratification in the workplace has also been recorded in several sectors across the globe. Women are discriminated against or marginalised in every human society, which is viewed as an entrenched global pandemic. Organisations across the world are increasingly considering a more inclusive working culture. Hence, there is a need for concentrated efforts to attract and retain female graduates in the real estate profession in order to support the industry's business development and growth. The study's findings could drive real estate organisations in Nigeria and other African countries to develop policy frameworks that encourage women to pursue careers in real estate. The Nigeria Institution of Estate Surveyors and Valuers (NIESV), the Estate Registration Board of Nigeria (ESVARBON), and women professionals must create a forum for women in the real estate sector to come together to share experiences, harness their skills and flourish. Also, symposia should be organised to bring female real estate students and upcoming women in the industry together to interact with successful women professionals in order to spark interest in the practice and drive for success in the industry, as well as to provide a platform for mentoring and networking.

The conclusions of this study, like those of most other studies, must be interpreted in the context of methodological constraints. The survey included only 41 graduating female real estate students from four tertiary institutions and five recent female real estate graduates. Meanwhile, the opinions of the female graduates supported the findings of the analysed questionnaire, implying that the responses analysed were generally applicable. Regardless of this assumption, a more longitudinal study with a larger sample size is necessary.

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EVALUATING THE ATTITUDES OF REAL ESTATE STUDENTS TOWARD PROPERTY VALUATION

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Abstract

Property valuation is a capstone course for real estate professionals and an essential component of core knowledge in real estate education. The prominence of real estate in the investment market and information asymmetries have created a demand for property valuation all around the world. However, anecdotal evidence suggests that real estate students rarely have positive attitudes toward property valuation. This condition can hinder understanding the contents and acquiring the requisite valuation skills as attitudes are critical for learning. It has been contended that developing positive attitudes should be the desired course goal. This study employs quantitative research designs to evaluate the attitudes of real estate students toward property valuation to determine whether the desired goal has been achieved. A self-administered questionnaire containing a modified SATS-36 attitudes assessment scale was distributed to all 87 Higher National Diploma (HND) I students after the first semester's valuation course. The findings suggested that the sampled students' attitudes toward property valuation were not negative. The students recognise the importance of property valuation for their careers, are ready to put up the effort to understand and acquire valuation skills, and believe they can learn property valuation. This study recommends that the pilot instrument used in this study be expanded to other polytechnics, universities, and nations in order to gather general data that may be used to guide the development of positive attitudes.

Keywords: Achievement, Developing positive attitudes, Real estate valuation, teaching and learning.

1.0. Introduction

Property valuation is becoming increasingly important in the world's public and private sectors. Real estate has become an essential vehicle in the investment market, and the demand for property valuation has increased in various countries (Xiaoa and Chanb, 2016). The key characteristics of the real estate market have evolved significantly with an increase in the number of local and foreign institutional real estate investors. Due to the complexity of the real estate markets, their increasing interdependence with the capital markets and changes in legal requirements, property valuers must possess a broad range of professional skills, including technical, organisational, analytical, and leadership abilities (Zrobek and Grzesik, 2019).

Property valuation is a capstone course for real estate professionals and an essential component of core knowledge in real estate education. Zrobek and Grzesik (2019) noted that the main challenge for valuation professionals is to develop their analytical skills and market understanding in order to provide acceptable valuations. Therefore, real estate students will need to be adequately trained and equipped with the requisite valuation knowledge and skills to prepare them better for the market and industry needs. Valuation is a fundamental course in the Estate Management curriculum of Nigerian universities and polytechnics. However, it appears that the study of property valuation has been biased over time (Peter et al., 2016), posing significant challenges for many students. According to Peter et al. (2016), valuation has a higher failure rate than other estate management courses since it is difficult for many students. Property valuation may be perceived as difficult due to mathematical approaches. Many social science students are taught to have a weak mathematical foundation; therefore, they dislike and struggle with courses in quantitative methods.

Several factors, including students' attitudes toward the discipline, influence their learning and academic achievement (Mazana et al., 2019). It has been contended that students' attitudes may impact their academic achievement and that lecturers should consider promoting positive attitudes about the subject as a course aim (Cladera, 2021). Scholars believe that students who leave a course with a positive attitude about learning the content are more likely to use the skills and strategies they gained outside the classroom (Garfield et al., 2002). As a result, attitude is an essential factor that should not be disregarded, particularly in real estate education.

Anecdotal evidence suggests that real estate students rarely have positive attitudes toward

property valuation. This condition can hinder understanding the contents and acquiring the requisite valuation skills since attitudes are critical in the educational process. When students' performances are typically poor, understanding their attitudes about the subject is critical to assist and encourage them in gaining interest. In this case, using an instrument to analyse students' attitudes toward the discipline became critical for lecturers to see if the objective of developing positive attitudes in their students was met (Cladera, 2021). This research employs a modified SATS-36 attitude survey instrument to evaluate the attitudes of the real estate students toward property valuation after taking the first semester valuation course. This is to determine whether the objective of developing positive attitudes in the students has been achieved. Specifically, this study analyses the academic and demographic characteristics of the real estate students, the students' attitude toward property valuation, the difference in attitude toward valuation by students' academic and demographic characteristics, and the relationship between students' attitudes toward property valuation and their final course achievement. No such study has ever been attempted. This study demonstrates how instructors may utilise a questionnaire to evaluate whether the desired goal has been achieved in their course by measuring real estate students' attitudes toward property valuation.

2.0. Background Literature

2.1. Attitude and Learning Outcome

Attitude is the learned proclivity of an individual to react favourably or unfavourably to an item, event, concept, or other people (Sarma and Puri, 2014). According to Hommik and Luik (2017), the nature of attitudes may be classified into three categories: cognitive, affective, and behavioural. The cognitive component deals with the knowledge, belief, opinion, and information that someone possesses regarding their attitudes; the affective is related to likes/dislikes or expectations, and the behavioural component outlines the expectations for behaviour in the future. In academics, positive attitudes are fundamental in the learning process. They can contribute to students' academic achievement while a negative attitude can commonly obstruct effective learning (Fullerton and Umphrey, 2001) and consequently affects the learning outcome, henceforth performance (Mensah et al., 2013; Joseph, 2013). With time, attitudes can develop and evolve (Syyeda, 2016); once a positive attitude is developed, it can enhance students' learning (Akinsola and Olowojaiye, 2008; Mutai, 2011). Students must believe in their abilities to understand the subject in order to do well in the course and be prepared to apply the ideas afterwards (Emmioglu and Capa-Aydin, 2012).

Previous research has revealed how important it is to understand attitudes in order to understand student achievement in general. The most dependable predictor of a student's performance is their perceived capabilities and success expectations (Wigfield and Eccles, 2000).

According to the literature on educational research, students' attitudes toward a field are crucial course outcomes, at least as crucial as knowledge and skills (Schau and Emioglu, 2012). The teaching strategies used by instructors should focus on developing students' positive attitudes about the discipline and their knowledge and skill growth so that they can adequately apply what they have learned (Cladera, 2021). Because negative student attitudes have been found to negatively influence the learning process (Schau and Emmioglu, 2012), it is vital to analyse instructional activities and techniques to make students "more comfortable" learning valuation. The initial step in this direction would be to develop methods to determine the students' attitudes toward property valuation. This study uses a measurement scale to assess students' attitudes to property valuation. When an instructor conducts an attitude assessment of his or her students, the instructor's efforts and instructional method will be focused on improving those aspects of the attitudes that the students have scored negatively (Cladera, 2021).

2.2. Attitude Survey Instruments

Various attitude survey instruments that employ Likert-type1 responses to statements have been developed to assess students' attitudes. The Statistics Attitude Survey (SAS) (Roberts and Bilderback, 1980) and the Attitudes Toward Statistics (ATS) survey (Wise, 1985) are the first recordings of studies that used the Attitude Survey instrument to study attitudes as an indicator of student achievement in statistics. These two instruments are among the most often used in statistical attitude research; however, the validity of the contents has been called into doubt (Ramirez et al., 2012), and their popularity has fallen.

According to Ramirez et al. (2012), SAS was criticised for being too one-dimensional because it only uses a single global attitude score. On the other hand, ATS was questioned for using only two attitude components, including "Field" (students' attitudes toward the use of statistics in their field of study) and "Course" (students' attitudes toward the course in which they were enrolled). Due to the limitations of these instruments, two more commonly used tools evolved in the years that followed: the Survey of Attitudes Toward Statistics SATS-28 (Schau et al., 1995) and the expanded SATS-36 (Schau, 2003). The SATS-36 consists of 6 attitude

[1] A Likert-type scale "requires an individual to respond to a series of statements by indicating whether he or she strongly agrees (SA), agrees (A), is undecided (U), disagrees (D), or strongly disagrees (SD). Each response is assigned a point value, and an individual's score is determined by adding the point values of all of the statements" (Gay, Mills, and Airasian, 2009, 150- 151).

components (Affect, Cognitive competence, Value, Difficulty, Interest and Effort) made up of 36 questions with responses on a 7-point scale (the endpoints being strongly disagreed and strongly agreed). Details of the SATS -36 scale are provided in the methodology section. Several studies have thoroughly investigated the SATS's reliability and validity (e.g., Griffith et al., 2012; Pearl et al., 2012; Vanhoof et al., 2011; Chiesi and Primi, 2010). According to Nolan et al. (2012), SATS-36 appears to have the most substantial evidence of construct validity and internal consistency. However, studies such as Coetzee and Van Der Merwe (2010) and Hilton et al. (2004) reported that the Difficulty component of the SATS often presents questionable reliability.

Although the SATS-36 survey was initially developed to examine students' attitudes toward statistics, Cladera et al. (2019) and Posner (2011) noted that the SATS-36 scale had been modified and applied in various educational contexts, interventions and teaching methods. This attitude survey instrument is mainly applied at the beginning and end of a specific course to assess the instruction's effectiveness (Posner, 2011; Gundlach et al., 2015). Researchers have used the SATS instruments for attitude studies in statistics (Male and Lumbantoruan, 2021; Hommik and Luik, 2017; Stanisavljevic et al., 2014; Khavenson et al., 2012; Ashaari et al., 2011; Chiesi and Primi, 2009). The SATS instrument has also been modified and applied in Mathematics (Mazana et al., 2019; Parnis and Petocz, 2016) and Econometrics (Cladera, 2021). Findings from these studies suggest that questionnaire has good reliability. In addition, students' attitudes to the subject under consideration were found to be slightly higher than the value that indicates indifference towards the subject, at least in some attitudinal components. Usually, the component related to the difficulty of the discipline is the one with the lowest assessment.

Furthermore, studies including Cladera et al. (2019), Rejon-Guardia et al. (2019), Stanisavljevic et al. (2014), Emmioglu and Capa-Aydin (2012) and Parnis and Petocz (2016) reported that students' attitudes toward a subject are related to students' gender, age, expected grade and achievement. Other studies also suggested that attitude influences expectations (Hood et al., 2012) and achievement (Mills, 2004). Cladera (2021) emphasised the importance of examining attitudes differences based on student characteristics, suggesting that this information may be utilised to identify students who are more likely to have negative attitudes and, as a result, will have more difficulty learning the content.

When studying differences in attitudes based on student characteristics, previous studies reported diverse outcomes for the six attitudes components. For example, Homik and Luik

(2017) identified gender differences in four attitudinal components: male students had higher mean scores than female students on the Competence, Value, and Interest components, whereas female students had significantly higher scores on the Effort component. Hannigan et al. (2014) previously discovered that, while there were no significant gender differences for any of the six components, female students tended to score lower on all components except Effort. Cladera (2021) revealed significant differences in men and women for Difficulty and Effort, noting that women demonstrated a more positive attitude than males regarding Effort and Difficulty. Significant variations in specific attitudinal components have also been discovered for other student factors, such as expected grade, prior interest in the subject, past success, and achievement (see Cladera, 2021, Hemmings and Kay, 2010).

The literature has emphasised the importance of attitudes to students' effective learning. There are currently no studies in the real estate field that evaluate students' perspectives on property valuation and no specialised tools for assessing students' attitudes toward this subject. The teaching of property valuation can face the same challenges as teaching statistics, mathematics, and econometrics. The SATS-36 is adapted in this study to assess real estate student attitudes to property valuation to provide an instrument to measure students' attitudes within the real estate educational context. The purpose is to offer a tool that instructors can use to assess their course outcomes. At the end of the course, valuation instructors can examine students' attitudes about the course to assess if the aim of instilling positive attitudes in students was met. If the data demonstrate that students' attitudes about valuation are not positive, the course's content and methods must be changed to support the emergence of positive attitudes.

3.0. Methodology

This study is based on the SATS attitudes assessment scale. This scale is a primary instrument that lecturers may use to assess whether the course's purpose of cultivating positive attitudes among students was met. This study used a modified version of the SATS-36 attitudes measurement scale to assess how real estate students feel about valuation at the end of the first property valuation course. The target population for this study is all the 87 Higher National Diploma (HND) I Estate management students at the Federal Polytechnic Ede Nigeria. These are undergraduate students who enrolled and finished their first semester's property valuation course in 2019. A survey was conducted at the end the valuation course. The students were asked to participate voluntarily and were also informed about the survey's goals and that the procedure would be completely confidential. At the end, all the 87

questionnaires were completed and returned. The scope of the research is to asses real estate students' attitude toward property valuation, analyse the differences in the attitudinal components by students' demographic and academic characteristics, and explore the relationship between students' attitudes to property valuation and academic performance.

A self-administered questionnaire comprising a modified SATS attitudes assessment scale, students' academic and demographic characteristics was developed. The SATS's traditional purpose is to assess students' attitudes toward statistics. The item writing was somewhat modified to assess students' attitudes toward valuation. For example, the first item ("I am scared by statistics" of the original scale was changed to "I am scared by property valuation"). Six attitude components and 36 items were utilised to assess Affect, Cognitive Competence, Value, Difficulty, Interest, and Effort (see Table I). These items were evaluated using a seven-point Likert scale ranging from 1 (Do not agree at all) to 7 (Totally agree) in line with the recommendation in Schau (2003). Following that, data on the students' performance after the valuation course was obtained and analysed. The performance measure was determined by taking average grades on a scale of 1 to 10 for all course tests, assignments, and examinations. The SATS-36 was chosen for this study because of its validity and reliability. In Parnis and Petocz (2016), a modified version of the SATS was used to assess attitudes toward mathematics, and the authors claim that attitudes and academic outcomes are correlated. SATS has been subjected to extensive statistical analysis, establishing the questionnaire's overall validity in different countries and with students from various backgrounds (Parnis and Petocz, 2016). Besides, studies in statistics, where there is a considerable body of research on students' attitudes, have revealed that past learning experiences and the relationship between the subject and mathematics impact attitudes (Anastasiadou, 2005; Schau, 2003). The challenge for statistics lecturers is to illustrate how statistics is entrenched in a context and how it needs a certain mode of thinking in which the data are not simply numbers but are numbers engaged in a context (Cobb and Moore, 1997). This might also apply to property valuation. Many students identify valuation courses with previous Mathematics and Statistics courses when they are initially introduced to them. As a result, many see it with apprehension and as a difficult course.

The data collected was analysed in line with the guideline provided in Schau (2003) and previous studies that used SATS as a tool to assess students' attitudes following the completion of a specific course (e.g., Cladera, 2021; Khavenson et al., 2012; Ashaari et al., 2011). First, all negatively expressed items were reversed so that all items may be interpreted the same way: the higher the item score, the better the student's attitude towards the item.

Second, the mean score for the individual item and each of the six components was determined and analysed. Based on the 7-point Likert scale used for this study, a mean score of 4 indicates a neutral attitude toward the item or component under consideration. Positive attitudes are represented by components and items with mean scores significantly greater than 4, whereas negative attitudes are represented by components and items with mean scores significantly lower than 4. Third, a reliability assessment using Cronbach's alpha was conducted for the total scale and each attitudinal component. It is helpful to evaluate the reliability of a measuring scale in order to demonstrate that it works in a new setting (Conroy, 2018). Fourth, using the t-test and ANOVA, differences in the mean scores of the attitudinal components by demographic and academic characteristics of the students were investigated. Finally, the relationship between students' attitudes to property valuation and academic performance was examined.

Table 1 Description of SATS-36 Attitude Components

Components	Number of items	Designed to Measure
Affect	6	Students' feelings concerning statistics
Cognitive Competence	6	Students' attitudes about their intellectual knowledge and skills when applied to statistics.
Value	9	Students' attitudes about the usefulness, relevance, and worth of statistics in personal and professional life
Difficulty	7	Students' attitudes about the difficulty of statistics as a subject
Interest	4	Students' level of individual interest in statistics
Effort	4	Amount of work the student expends to learn statistics

(Schau, 2003).

4.0. Results and Discussion

This section discusses the findings on real estate students' attitudes toward property valuation, organised by the research objectives. The first subsection presents the academic and demographic characteristics of real estate students. The result of the analysis of students' attitudes to property valuation followed. Next, the differences in attitudes toward valuation by students' academic and demographic characteristics were examined. Finally, the relationship between students' attitudes to property valuation and their final course performance was assessed.

4.1. Characteristics of the Real estate students

Most of the students were men, 69.00 per cent. A total of 48.3 per cent ranked their earlier interest in valuation as high or very high and 43.7 per cent as medium. Regarding the expected grade on the course, 67.8 per cent of the students expect grades (out of ten) between five and seven, and 15.0 per cent expects higher than seven.

Table 2: Characteristics of the Respondents

Variables	Percentage (n=87)
Gender	
Male	69.0
Female	31.0
Earlier interest	
Small	8.0
Normal	43.7
High	37.9
Very high	10.4
Expected grade	
Lower than 5	17.2
Between 5 and 7	67.8
Higher than 7	15.0

4.2. Attitudes of real estate students towards property valuation

Property valuation is an important subject in real estate education. The exposed perspective is that instructors should value the development of positive attitudes toward their courses as much as the acquisition of skills and knowledge. As a result, determining whether or not this goal has been met at the conclusion of the course is crucial. It is proposed that an attitude measurement scale be used for this purpose. The SATS is adapted in this work since there is no specialised scale for measuring attitudes toward property valuation. Earlier research that adapted and utilised the SATS instrument in in statistics and other subjects such as Mathematics (Mazana et al., 2019; Parnis and Petocz, 2016) and Econometrics (Cladera, 2021) demonstrated that the scale had high reliability. Property valuation as a quantitative approach might confront the same challenges as statistics, mathematics, and econometrics, where students frequently see quantitative methods as difficult, "unpleasant," and complicated. Table 3 presents the mean scores for the SATS individual items and components, the standard deviation and the Cronbach's alpha (which shows the reliability of the measurement scale). The mean score indicates the attitude level; the higher the mean score,

the more positive the attitude.

Table 3 Mean scores of adapted SATS-36© items and components, the standard deviation of the components, Cronbach's alpha of the total scale and components

	Mean score	SD	Cronbach's alpha
Affect	**4.19**	**1.04**	**0.761**
I have liked valuation	4.48		
[R] I still feel insecure when I have to do valuation exercises	3.51		
[R] I have felt frustrated going over valuation tests in class	4.06		
[R] I have been under stress during valuation classes	3.77		
I have enjoyed taking valuation courses	3.63		
[R] I am scared by valuation	5.66		
Cognitive Competence	**4.64*** **	**1.14**	**0.782**
[R] I have had trouble understanding valuation because of how I think	5.16		
[R] I have no idea of what's going on in this valuation course	5.68		
[R] I have made a lot of math errors in valuation	4.54		
I could learn valuation	4.50		
I will understand valuation equations	4.34		
[R] I have found it difficult to understand valuation concepts	3.59		
Value	**4.65*** **	**0.97**	**0.772**
[R] Valuation is worthless	5.88		
Valuation should be a required part of my professional training	5.60		
Valuation skills will make me more employable	3.76		
[R] Valuation is not useful to the typical professional	5.62		
[R] Valuation thinking is not applicable in my life outside my job	4.66		
I use valuation in my everyday life	1.98		
[R] Valuation knowledge is rarely presented in everyday life	4.23		
[R] I will have no application for valuation in my profession	4.93		
[R] Valuation is irrelevant in my life	4.47		
Difficulty	**3.68**	**1.47**	**0.620**
Valuation formulas are easy to understand	3.56		
[R] Valuation is a complicated subject	3.42		
Valuation is a subject quickly learned by most people	2.22		
[R] Learning valuation requires a great deal of discipline	3.34		
[R] Valuation involves massive computations	4.67		
[R] Valuation is highly technical	3.71		
[R] Most people have to learn a new way of thinking to do valuation	4.82		
Interest	**4.12**	**1.23**	**0.754**
I am interested in being able to communicate valuation information to others	4.05		
I am interested in using valuation	3.76		
I am interested in understanding valuation information	4.24		
I am interested in learning more valuation	4.43		
Effort	**5.70*** **	**1.32**	**0.824**
I have done all my valuation assignments test	6.13		
I have worked hard in my valuation course	5.34		
I have studied hard for every valuation	5.59		
I have attended every valuation class session	5.74		
Total			**0.863**

[R] Reversed item.

*** Significantly different from 4 at 1% significance level.

Looking at the values of the mean score in Table 3, most of the individual items obtained a mean score above 4, indicating a positive attitude from the students. Table 3 also shows the average mean score for the attitudinal components. Cognitive competence, Value and Effort have positive mean scores (at least 4.64), which is significantly higher than 4. The mean scores of the Affect (4.19) and Interest (4.12) are neutral, while the Difficulty component obtained a negative mean score (3.68). These results suggest that students acknowledge the value of valuation for their professions, are willing to put in the effort required to acquire and improve their valuation skills and feel capable of learning property valuation. The students do, however, feel that valuation is a difficult course to take. The students do not particularly enjoy or show much interest in valuation but do not particularly despise it. These findings indicate that the surveyed students' attitudes toward valuation are not negative. Except for the difficulty component, all components score neutral or marginally positive ratings. As observed in Cladera (2021), the component relating to the difficulty of the discipline typically receives the lowest rating. Although no research on students' attitudes to valuation has been conducted, these findings are consistent with those of earlier studies on students' attitudes toward statistics (Cladera et al., 2019; Stanisavljevic et al., 2014; Ashaari et al., 2011).

Furthermore, as suggested in Conroy (2018), the internal consistency for each component score of the SATS scale was calculated to determine its reliability. The results of the Cronbach's alpha, as seen in Table 3, indicates that the entire scale's reliability (0.863) is good. this result is consistent with earlier studies that applied the modified SATS instruments in Mathematics (Mazana et al., 2019; Parnis and Petocz, 2016) and Econometrics (Cladera, 2021). In terms of each of the components, the reliability of Affect, Cognitive Competence, Value, and Effort are acceptable, while Difficulty is questionable. This conclusion is consistent with findings in other studies; nevertheless, the reliability of the difficulty component is typically the lowest, generating values that are in dispute (Cahyawati et al., 2018; Coetzee and Van Der Merwe, 2010; Hilton et al., 2004).

4.3. Differences in attitudes towards Property valuation by students' characteristics

In this subsection, the differences in students' attitudes about valuation were examined by their academic and demographic characteristics. A test of normality using the Kolmogorov-Smirnov test indicates that the scores for all attitudinal components have a normal distribution. Consequently, t-test and ANOVA were employed to test if there were differences in the mean scores of the attitudinal components based on the students' characteristics. Table

4 presents the mean scores of the attitudinal components by the student's characteristics.

Table 4 Mean scores for the attitudinal components by students' characteristics.

	Affect	Cognitive Competence	Value	Difficulty	Interest	Effort
Gender				**		***
Male	4.11	4.61	4.32	3.69	4.08	5.23
Female	4.40	4.92	4.87	3.97	4.24	6.02
Earlier interest			***			
Small	4.20	4.48	3.66	3.01	4.04	5.68
Normal	4.63	4.72	4.42	3.92	4.10	5.42
High	4.32	4.42	4.79	3.48	4.17	5.78
Very high	4.99	4.33	4..99	3.88	4.98	5.99
Expected grade	***	***		***		
Lower than 5	3.03	3.96	4.22	3.39	3.98	5.64
Between 5 and 7	3.94	4.52	4.65	3.62	4.31	5.44
Between 7 and 9	4.25	5.86	4.37	4.31	4.63	6.10

*** significantly different at 1% significance level.
** significantly different at 5% significance level

The results in Table 4 indicate that men and women differ significantly regarding Difficulty and Effort components. Women show more positive attitudes about these components than men. Previous studies (Rejon-Guardia et al., 2019; Cladera et al., 2018; Homlik and Luik, 2017; Hannigan et al., 2014; Stanisavljevic et al., 2014) documented that the female gender is more positive when it comes to Difficulty and Effort. Regarding the students' earlier interest in valuation, significant differences exist in Value. The mean score for the value attitudinal component rises as students' interest in valuation grows. Based on the grade the student expected to get in the course, there are significant differences in the mean scores of Affect, Cognitive Competence, and Difficulty. The higher the expected grade, the more positively these components portray students' attitudes. Hood et al. (2012) earlier confirmed that attitude influences expectations. Students with a more positive attitude toward a course tend to have higher expectations for themselves and better achievement in the classroom.

4.4. Relationship between students' attitudes and achievement in Property valuation

This study also investigated the relationship between students' attitudes to property valuation and their final course performance by measuring their correlations. The performance measure was computed using the average grade earned on all the course

assignments, tests and examinations on a scale of 1 to 10. Table 5 presents the correlation coefficients between attitudinal components and students' performance in the property valuation.

Table 5 Correlations between the attitudinal components and students' performance.

Dimensions of students' attitudes	Performance
Cognitive Competence	0.634**
Affect	0.603**
Value	0.562**
Difficulty	0.454**
Interest	0.423**
Effort	0.197

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UNPACKING THE STRUCTURE AND FUNCTIONING OF THE URBAN RENTAL HOUSING MARKET IN KUMASI, GHANA

Irene-Nora Dinye and Romanus Dogkubong Dinye

Abstract

Urban Housing in Africa is dominated by the private rental sector. The sector delivers over 90 percent of housing units in urban Ghana. In spite of this, the urban rental housing sector appears unstructured, complex and informal. Using Kumasi as the primary case, this paper sought to answer the following questions: How is Ghana's urban rental housing market structured? Who are the main actors in the market and what are their roles? How do the relationships and activities of these actors shape rental housing? Rooted in the theory of market economy, the study adopted multiple qualitative methods, including observation, focus group discussions; key informant interviews, institutional consultations and document reviews to gather evidences. The paper reveals the non-existence of a comprehensive institutional and policy framework for the delivery and management of rental housing; thus, giving rise to informal operations of the sector. In the face of rapid urbanisation and rising costs of housing materials, the supply of rental housing lags behind demand leading to high costs of rent and exploitation by prospective tenants.

Keywords: Rental Housing, Urban Housing Market, Urban Housing, Kumasi, Ghana

1.0. Introduction

The importance of rental housing as an option for delivering urban housing in sub-Saharan Africa is established (Gulyani et al. 2012; Adu-Gyamfi et al. 2020; Gilbert et al., 2011; Peppercorn & Taffin, 2013; Akaabre et al., 2018). For instance, in Nigeria rental housing is the main housing tenure among the urban dwellers with 57% and 65% of households in Lagos and Benin City being renters respectively (Ikejiofor, 2014; UN-HABITAT, 2013). Similar trends pertain in Ghana's tenure statistics with about 53% of households in Accra and more than 62% in Kumasi resort to rental housing (Ghana Statistical Service [GSS], 2012, 2013; UNHABITAT,

2013).

The urban rental market in sub-Saharan Africa is fraught with several challenges (Asante et al., 2021). Majority of urban dwellers reside in deteriorated, overcrowded structures and may often experience limited access to basic amenities such as sanitation, water and waste disposal systems (Appeaning-Addo, –2016; Obeng-Odoom & Amedzro, –2011) at a relatively higher cost (Luginaah et al., 2010). Ehwi et al (2021) observe that, most housing units are also rented with limited furnishing; necessitating renters to assume the cost of furnishing. Compounding the affairs is that urban dwellers have to pay their rents in advance (Asante et al., 2021) contrary to Ghana's Rent Act, 1963 (Act 220). Moreover access to information on rental units is limited, which compels renters to embark on personal search and relying on information from friends, family members and estate agents to find accommodation (Adu-Gyamfi et al., –2020; Gavu et al., '2019).

Attendant body of scholarly works suggests urban rental accommodation is limited, competitive, expensive, unaffordable and hence difficult to reach by many tenants (Adarkwa, 2011, 2012; Boamah, 2010). Gavu et al (2019) asserts that this situation emanates as a result of the disparity in expected and existing Residential Rental Values (RRVs). This has been attributed to two main reasons; the informality of the rental housing market and limited discourse to adequately examine and conceptualise the structure of the housing market. Considering the largely informal rental housing sector it is contended that; understanding the operations of the housing market is crucial for effective policy making that will promote and regulate the housing market. The reiterates this by emphasizing that *"it is important that policymakers understand the intricacies of their cities' rental housing (both formal and informal) and know how to formulate effective, flexible policies to promote and regulate it."*

This study was developed in response to this background; to garner a sound understanding of the structural characteristics of the rental housing market in Ghanaian cities towards building a fundamental basis for policy re-orientation and intervention. A recent study by Gavu (2022) conceptualised rental housing in Ghana using housing typologies, housing forms, and submarket definitions to pin down how the market functions in a developing country context.
Situated within the context of a market economy conception the study draws on documentary and empirical evidences from Kumasi. A market economy is a setup whose operations are determined by the forces of demand and supply for commodities. This study argues that the rental housing responds to local economic, social, and political realities as well as legal frameworks, and may function differently in different cities. This paper seeks to answer the following questions: How is Ghana's urban rental housing market structured?

Who are the main actors in the market and what are their roles? How do the relationships and activities of these actors shape rental housing? The intent is to not only to foster the identification of strengths and opportunities it offers for the delivery of decent housing; but also, for clarity on the inherent weaknesses and constraints that retard its efficient performance.

Whilst this section provides for the introduction of the paper, section two conceptualises the Urban Rental Market within the context of the market economy. This is followed by a description of the study area and outline of the research methods in section three. The findings of the research are presented in section four. Section five is devoted to the conclusion reflecting on implications of the findings for private rental housing, market theory and research methods.

2.0. A conceptual review of the rental housing market

Rapid urbanisation, increasing population growth and density has put high pressure on the existing urban housing stock causing shortage in residential accommodation, in Ghanaian cities such as Kumasi, and Accra (UN Habitat, 2013). The inability of housing delivery to keep pace with the rapidly increasing urban population has led to severe overcrowding, congestion, and slum development (Ardayfio-Schandorf, 2012; Aluko, 2012; Obeng-Odoom, 2013; UN-Habitat, 2020).

Currently, Ghana's housing deficit has now hit two million units and it is estimated that an annual delivery of about 170,000 to 200,000 units is required to bridge the gap in the next 10 years (Afrane et al., 2016). Most households occupy single rooms in compound houses and other forms of multi-occupied residential buildings. They endure structural shelter deterioration, overcrowding, poor hygiene, and sanitation amidst inadequate access to service facilities, which are consequences of housing shortage (Yankson & Bertrand, 2012). Due to this, many urban dwellers have taken to residing in temporary housing such as kiosks, tents, cargo containers, or extensions to shops or offices. In major urban centres which include Accra, Kumasi, and Tema, this apparently is a phenomenon (Mahama & Adarkwa, 2006).

The foregoing gives a brief overview of Ghana's housing sector, with a particular focus on the urban rental sector. The rental housing market is dominated by informal sector operators

(Arku et al., 2012), who acquire their own land and engage the services of tradesmen to build incrementally, based on resource availability (Amoako & Frimpong Boamah, 2015). The rental sector provides housing units for all income categories of households and accounts for approximately 90% of housing stock in urban Ghana (Ehwi et al., 2021). The dominance of the sector makes it central to housing research, policy and development. This study adopts the theory of the market economy as a conceptual lens through which Ghana's rental housing sector may be explained and understood.

The market economy is a system in which decisions on production, distribution and pricing of goods and services are guided by the interactions of individual citizens and businesses with limited or no state involvement (Lazonick, 2003). This limited or absence of dominant political control mechanisms is the central underlying principle for the operation of the market economy. The theory proposes that exchange of goods and services is through voluntary transactions along the dictates of demand and supply forces prevailing in the market. Suppliers are profit oriented and always add value or improve their supply to make more profits .

In adopting the theory of the market economy, as a conceptual lens, this work is guided by three key observations inferred from the literature on the urban rental housing market in Ghana and other cities in Africa. The first observation is that there is continuously increasing demand for rental housing in African cities shaped by their rapid urban growth and population increases. This puts pressure on the rental housing sector which is unable to supply adequate and affordable units to meet the increasing demand —'——''''''). A second observation is that the supply of rental housing units in the urban areas is limited 2012) . This is because the sector is dominated by informal private operators who are challenged with increasing cost of materials, unclear land tenure and administrative systems and poor institutional and legal environment (Appeaning Addo, 2016). The sector is also impeded by inadequate access to housing finance, skilled labour for construction, and housing infrastructure (Gavu et al., 2019). Again, the public sector's involvement in the provision of rental housing has been minimal '.

Following the two observations above, the third observation is that the rental housing market is characterised by unregulated pricing system, which is a result of the unmatched relationship between the supply and demand sides of the market. As a result of increasing demands coupled with limited supply, the pricing of rental housing is left at the mercy of suppliers leading to the exploitation prospective renters . Inherently this has led to limited competition in the supply of urban rental housing units whereby the informal private rental

entity charges exorbitant rents (Gavu et al. 2019) and Advance Rent (AR) (Ehwi et al., 2021). On the demand side, urban dwellers are faced with challenges of limited information and restricted choices of decent and affordable units (Adu-Gyamfi et al., 2020). Consequently, many urban dwellers have taken to residing in temporary housing such as kiosks, tents, cargo containers, or extensions to shops or offices.

It can herein be argued that the 3 observations above define Ghana's rental housing: increasing demand, limited supply and unregulated pricing and distribution system. In adopting the theory of the market economy as a conceptual lens for this study, the structure of the rental housing market is studied at three levels, namely: the demand side with all its stakeholders; the supply side and all its major actors; and the broad network of institutions, regulations, legal regimes and stakeholders that shape the market.

In this study the demand side includes individuals, groups and companies in search of rental accommodation in urban areas. These are not defined and include all urban residents, who may at any point may require rental housing. The supply side is made up of associations of private developers, real estate companies and agents, land owners, dealers in housing materials etc. The network of stakeholders includes all individuals, institutions and regulations that facilitate the activities and operations of the market. The trends and processes involved in the inter-play of demand and supply of rental units, to produce price defines the market.

3.0. Study Setting and Method

3.1. Kumasi as the Study Context

The city of Kumasi, Ghana's second largest is the primary study context; and purposively selected due to its suitability for the study. The city is the fastest growing in Ghana with annual population growth rate of about 5.4 per cent (Amoako and Adom-Asamoah, 2019, p.314) and an earlier estimated housing delivery rate of 8.6 per cent per annum (Owusu-Ansah & O'Connor, 2010). Kumasi accommodates approximately two-thirds of Ashanti region's population resulting in its rapid growth and expansion in the past few years. Consequently, the city's rental housing market has seen increases in demand, dwindling supply and general changes in operational dynamics '''. Thus, Kumasi's rental housing market provides more complexities suitable for this study. It is important to note that, as a result of its rapid expansion and population growth, the original city has been re-demarcated to form the

Kumasi Metropolitan Area (KMA) and 6 surrounding local government areas, namely: Oforikrom, Kwadaso, Suame, Old Tafo, Asokore-Mampong, and Asokwa Municipalities (Figure 1)

Figure 1: The Re-demarcation of Kumasi into Municipal Areas
Source: Drawn by Authors, August ,2022

In spite of the re-demarcation, the city functions and grows as a unit with similar challenges across all the local government areas. The KMA and the surrounding municipalities still share common utility services, land administration systems and other network infrastructure which include roads, telecommunications, water and power systems etc. All these infrastructural services and facilities are provided and managed by the same institutions for all the municipalities. Similarly, the rental housing market exhibits similar characteristics across the city, with minimal differences in internal dynamics.

However, for the purposes of an in-depth study the Oforikrom municipality was purposely selected (See Fig 2). The Oforikrom municipality houses one of Ghana's major public universities- Kwame Nkrumah University of Science and Technology. In the last few years the university has increased its staff and student population to over 150,000 . This has generated a brisk demand for various options of rental housing ranging from hostels, apartments and

Figure 2: The Oforikrom Municipality
Source: Drawn by Authors', August, 2022

3.2. Study Method

The case study research design was adopted for the study (Crowe et al., 2011), with the Kumasi metropolis as the primary case; and Ayigya and Ayeduase communities being the two case contexts. In line with the case study design, multiple qualitative methods were used to gather and analyse evidences from multiple sources (Humphries and Gourney, 2008 p. 87) both within and outside the case communities. Thus, data collection instruments used included interview guides for institutional consultations; observational checklists, semi-structured interview guides, Focus Group Discussion guides, and transect walk checklists.

Secondary data were also sourced from reports and published literature. Institutional Interviews were conducted with the Chief Rent Control Officer and the Rent Manager at the Rent Control Department at the Kumasi Metropolitan Assembly (KMA) which still acts as a key institution for the management of rental housing across the city. In the two case communities the researchers embarked on transect walks to observe housing conditions of residents in the

study community. Through the assistance of assembly persons from the study communities; FGDs were organised with the Landlords Associations purposely selected because of early access and their acceptance to participate in the study they were selected from Ayeduase and Ayigya respectively.

In each of the communities, 5 private rental agents each were selected through snowballing and interviewed. The data collection phase was climaxed with a mini stakeholder conference that drew a network of stakeholders from Oforikrom municipality of Kumasi with focus on Ayigya and Ayeduase Communities. These stakeholders include: Oforikrom Physical Planning Department (2), Rent Control Department (2) State Housing Corporation [SHC] (2), Traditional Leaders (2), Students (2), Landlords Association [Ayigya and Ayeduase] (2) Assembly Persons [Ayigya and Ayeduase] (2), Association of the Deaf (1), Members of the Ghana Real Estate and Developers Association [GREDA] (2) Private Real Estate Agencies (2) and Academia (3).

Table: Number of Stakeholders and Respondents Interviewed

Interviewees/Units	Method of Data Collection	Total of Participants
Rent Control Department	Institutional Consultation	2
Private Rental Agents	In-depth Interviews	10
FGD with Tenants in Ayigya and Ayeduase	Focus Group Discussion	16
FGD of Landlords	Focus Group Discussion	10
Network of Rental Housing stakeholders	Mini Stakeholder Workshop	22

Source: Author's Field work, 2021

At the mini workshop the stakeholders were given the platform to discuss the three main themes under the rental housing market been studied - trends and challenges of the demand side of the market; the supply side; and the network of institutions and stakeholders managing its operations and structure. The views and opinions of all stakeholders were summarized during the plenary sessions and presented in a report which feeds into this paper.

4.0. Analysis and Discussion

4.1. The State of Rental Housing in Kumasi

The rental housing sector in Kumasi is dominated by informal sector operators, who provide over 92% of the rental housing stock. The sector can be categorised into 5 sub-groups, based on the type housing and facilities provided. These are:

- Compound with shared facilities and courtyard: These are the leading informal sources of the supply of rental units. They are available in most suburbs of the city especially in informal settlements and slum communities. They provide a wide range of options for low to middle income residents of the city.
- Apartments with separate internal facilities but shared courtyard: This group of rental units are provided for middle to high income renters. They are usually made for single households and provide common areas for interaction and domestic functions. There are instances where utilities such as electricity, water and internet are shared by residents.
- Semi-detached with internal facilities and separate courtyard: These are similar to apartments. However, they usually have separate compounds for the individual households that are renting the various units. In most cases, the use of utilities is separated; even though some semi-detached houses share common utilities.
- Detached housing with separate internal facilities (courtyard and all supporting systems which include meters): These are provided for high income and upper-class groups, who select their rental units based on the need for privacy, security and safety. They are usually smaller-sized households that work in stable companies and institutions. All utilities are private and in some cases backup systems are available like standby generators, borehole water systems and reservoirs etc.
- Hostels and Homestels for the ever-increasing youthful population in the city. This group of rental units were found to be emerging in newly developing suburbs around major educational institutions, construction sites, major markets and industrial areas. They provide temporal to semi-temporal accommodation to largely youthful population, studying in the educational institutions or working in the areas close to the hostels. There are different types of hostels ranging from self-contained facilities, shared facilities and those without internal facilities.

The existing institutional and regulatory frameworks meant constitute the environment for the operation of the rental housing market is weak and inadequate. The various Metropolitan and Municipal Assemblies have not been able to provide clear guidelines for the regulation of

the various components of demand and supply is fragmentary. Even the government sector which is relatively known has not been efficiently managed. In the absence of a comprehensive, clearly defined national housing policy, the institutional framework required to galvanise the interrelationships among the various components is fragmentary with negative implications on the functions of the market. Kumasi has public rental accommodation for the staff of the ministries, departments, the military, and other security agencies, as well as the education and health institutions which include the city's two public universities, training colleges, government-assisted senior high schools and the public hospitals and other health facilities (See also Afrane & Asamoah, 2010). They include the estates at Asawasi, North and South Suntresu, Kwadaso and Patasi, Ahinsan and Chirapatre, Buokrom and Pankron (see Figure 3).

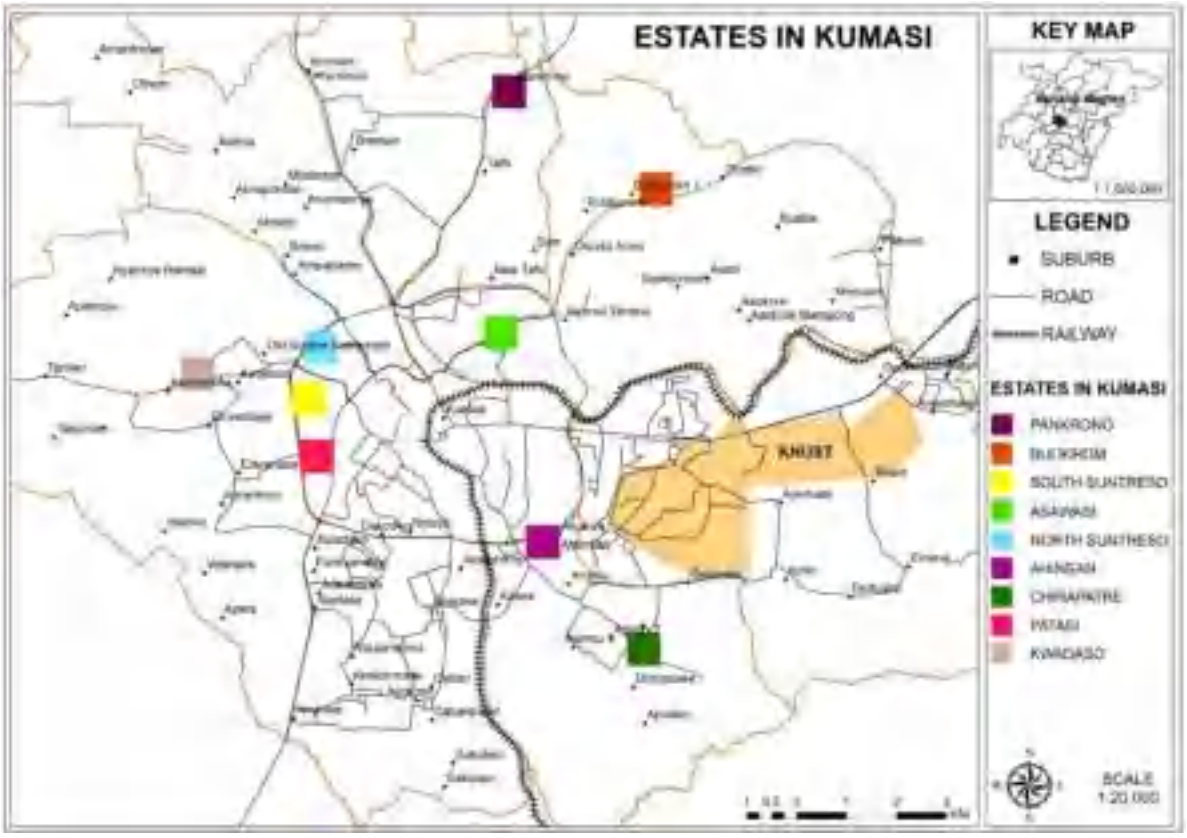

Figure 3: Public Rental Housing in Kumasi
Source: Drawn by Authors, 2022

[2]This is coined from *"home"* and *"hostel"*; which means rooms within a house that are rented out to students, backpackers and itinerant young workers seeking accommodation. It may or may not have other permanent tenants who are indigenes of the city or neighbourhood.

The provision of estate housing has ceased. However, some institutions continue to provide rental housing units for their staff. These include the educational institutions, health facilities and government-assisted senior high schools. Public and institutional rental housing provision is inadequate for staff of the various institutions. As a result, they depend on the informal private sector for rental accommodation. Some reflections from key informants attribute the predominance of private rental housing to the inadequate supply of public rental accommodation:

> *"…the terms and conditions in this market segment are established by the government and operationalized by the various pertinent institutions. However public sector housing supply falls far short of demand…you will always hear civil servants complaining about queue-jumping and favouritism in the processes of allocation in government institutions…" [Participant-Stakeholder workshop].*

The inability of the public sector to provide rental units for its workers and support the informal sector is seen in the above quotation. The dominance of the informal sector in the provision of rental housing units in the city of Kumasi is also shaped by the nature and operations of the institutions and stakeholders operating within the sector.

4.2. Actors in the Rental Housing Market and the Operational Characteristics

To understand the operations of Kumasi's rental housing market, the key actors have been identified and their roles, contributions and challenges discussed. In line with the study's objectives, the actors in the rental market have been presented under the three thematic areas guiding the study: Actors on the supply side; those on the demand side and those regulating or playing mediating roles in the market.

4.2.1. Actors on the Supply Side of the Rental Market

Landlords

The first group of actors on the supply side of Kumasi's rental market are the landlords or property owners in the city. There are 3 categories of landlords in the city. These are: a. owner-occupier – who are landlords who have completed their buildings, live in them and have rented some rooms out to tenants. b. absentee owners- individuals who built or purchase houses to partially or wholly let out for rental purposes. These could be residing in or outside

Kumasi; and c. and caretaker landlords who inherit the residential properties from deceased relations and let them out on rent (also see Adu-Gyamfi et al, 2020; Adu-Gyamfi, 2021).
The residential status of the landlords has implications for the rental housing conditions. In the cases where landlords reside in the houses with their tenants, it was observed that the houses are relatively well-maintained; as compared with those that have only tenants occupying the property. This is because in most cases the tenants were of the view that because they have fulfilled their financial obligations to the landlords, it was their (landlords) duty to maintain the house. However, if the landlord is also resident in the house, he/she imposes rules that when defaulted could elicit eviction. For instance, the narrations of Key Informants are outlined below:

> *"We hear all kinds of complaints…when the landlord lives on the same premises with you, you cannot say you won't sweep, or keep the place tidy and stand by while the landlord and the family do all these tasks…"* ***[Key Informant Interview, Rent Control Department]***

> *"…It is even harder when the tenant is younger and unmarried, some landlords go to the extent of imposing curfews!"* ***[Key Informant Interview, Rent Control Department]***

Thus, the various role of the landlord as the builder, with the responsibility to maintain, manage and regulate the rental property is highlighted as fundamental to the supply side of Kumasi's rental housing market.

Rental Agents
The second group of actors on the market are rental agents (see Akaabre et al. 2018). The informal rental agents in Kumasi are mostly within 30 to 50 years age range and mainly males (the study did not come across any females). Akaabre et al (2018) maintain that this may because females view the activities as illegal, intensive and stressful in nature.

Interactions with rental agents revealed low educational qualification mostly below senior high school in terms of grade. None of them had professional training and their knowledge in formal estate management. This gives credence to studies by Mends (2006) and Mahama and Dixon (2006) who argued that several real estate agents in developing countries, especially in Africa have inadequate education and professional skills in property transactions but render

services like property valuers.

Thus, it was unsurprising to that their record keeping is somewhat haphazard but nonetheless a very good with reference to contemporary the clients they are dealing with. Accounts from other Key Informants of the study suggest that these rental agents seldom have permanent locations or offices from which they operate and are hard to find particularly in the event of non-performance.

These rental agents possess a unique endowment of information on the city's rental housing market that they use at their discretion. Landlords inform them of the vacancies they have, and prospective tenants make indications to them about the type and location of the rental units they are seeking for. They constitute the pivot for easy interface between the landlords and prospective renters. They fill in the gap of the lack of database on rental housing in Kumasi and for that matter Ghana. In the absence of credible public records, they constitute the vital source of information on vacancies and points at which rental accommodation are lodged. In some cases, they stand as in stead to witness the rental transactions between the landlords and tenants.

> *"We don't really struggle with getting renters, immediately we put up our posters for new rentals we get phone calls… sometime several people would want a particular housing unit and the landlord may decide to opt for an individual based on the highest bidder, the kind of work the family size, personal conviction for character…"* ***[Key Informant, Rental Agent-Ayigya]***

> *"Our clients are sometimes people who have seen our posters or referrals from past clients. Sometimes we have past clients who want to relocate to larger housing units or different vicinities who inform us to be on the lookout when their rent is almost due".* ***[Key Informant, Rental Agent-Ayeduase]***

They are knowledgeable in the rental housing market conditions of the city and as such used as the basic key informants in this study. Their thoughts, perceptions and opinions on the elements of the rental housing market structure were sought to reflect the challenges in its operations to generate the information basis for subsequent strategic formulation to address the rental housing issues.

4.2.2. Actors on the Demand Side of the Rental Housing Market

On the demand side of the rental market are the various categories of tenants. These include individual renters, households and corporate entities who may want to rent properties for their staff. These categories of renters/tenants have a wide range of needs which are translated into the factors for the choices of rental units they select. Consequently, the study revealed that demand for rental housing in Kumasi are influenced by the following:

a. Features of building structure which include its age and physical conditions, the type of the dwelling units, number of rooms and the amenities (water, electricity, toilet and bathroom and move-in conditions);
b. The locational environmental comprising the neighbourhood characteristics regarding safety and security from crime and disasters such as floods, air, water and waste pollution;
c. Socio-demographic and economic characteristic considering household size, ethnic and religious affiliations, affordability of cost of renting and rent advance payment and the gender status of the landlord;
d. Accessibility to place work, educational and health facilities and government intervention by way of rent subsidies and rent control.

The decision made through the consideration of the above factors is a key role of renters to improving the supply of rental housing. This is because the standards for providing housing and pricing them are influenced by the factors presented above.

Although the demand for decent accommodation is high amongst the economically active population in the city, it is not backed by the ability to pay to induce a vibrant supply-side response.

> *"The outright payment of a standard two-year rent advance is not easy for many as a result people resort to the option of staying rent-free in family houses or perching with relatives and friends whilst working until they can afford to pay the rent advance for their own places." [Key Informant Interview, Rental Agent-Ayigya]*

> *"Many of the renters with a family size of 5 or 6 would prefer to rent a chamber and hall despite the congestion…they normally tend to save rather than spend much of their income on a larger space…"* ***[Key Informant Interview, Rental Agent-Ayigya]***

The decision of consumers to abstain from consumption and rather save and invest has relevance and significant impact in rental housing. This is a matter of choice between the present and the future. The opportunity cost incurred by saving instead of consumption bears fruit in the form of the resources gathered to pay advanced rent demanded from new renters by landlords in the initial stages of tenancy transactions. Such an advanced payment enables the landlord to remould existing the product or finish an uncompleted property to suit the taste of the tenants before their occupation.

> *"Though very common in Accra, renters in Kumasi are now increasingly seeking for rooms that have all the facilities in their housing units… this has introduced the single room self-contained type of unit. Landlords take the advance rent to install kitchenette and toilet facilities into the single room unit. Landlords subsequently charge tenant exorbitant rents for such housing units…'* ***[In depth Interview, Rental Agent-Ayigya]***

The above shows the growing agency of renters in the market; to be able to have a voice in the style, quality and functioning of the rental units provided.

4.2.3. Actors in the Regulation and Mediation of the Rental Housing Market

Though largely informal, the rental housing market is regulated and mediated by relevant state institutions and their surrogates. Thus, the state is seen as the central actor in the regulation of the market. Nonetheless, the state has been slow in reacting the needs of the renting populace.

The state has a prominent place in terms of policy which it does through the Ministry of work and housing. The policy directions until the 1990s were the direct provision of rental dwellings, rent subsidies, subsidised interest rates and rent control.

In terms of housing provision, some Key Informants explained that Government rental housing provision in Kumasi was carried out in the past by the State Housing Corporation through the development of housing estates. At the same time state financial institutions which include the Social Security and National Insurance Trust (SSNIT) and the State Insurance

Trust were encouraged to develop housing estates for rent as capital investment.

> *"…The rents were however too high for the target low income bracket but then too low to allow for the return on investment to maintain the capital bases. The houses provided by these parastatal agencies have, been sold to the tenants…"* ***[Participant, Stakeholder conference]***

The institutional framework for housing governance and more so rental housing at the city level has tended to be weak. The pursuit for the delivery and management of the housing sector falls under the ambit of the Kumasi Metropolitan Assembly. In a situation where the informal rental housing sector is not only growing but even thriving in the provision of accommodation for a large proportion of the urban population is indicative of the inefficiency of the formal sector to deliver. This is quite well an observed reflection of the situation at the national level whereby housing policy formulation and strategic development of a comprehensive framework has hinged on for a decade without successful manifestation. At the Ministry of Works, Housing and Water Resources, housing matters in the entire country is subsumed under a directorate in a competitive position with those of public works and water sectors of the ministry. The case for housing is hardly ever well-articulated at macroeconomic level as can be observed scanning through the documents of the massive Structural Adjustment Programmes as well as Poverty Reduction Programmes that have each spanned not less than a decade in terms of period of implementation in the country.

At the Kumasi Metropolitan Assembly, the Ministry of Works, Housing and Water Resources is represented by the Department of Public Works. Like most other sector Departments under the Assembly, the outfit is ill-equipped with the pertinent manpower and budget to effectively deliver. Most of the population in rental housing the city has been accommodated through the initiatives and efforts of private. Renting from the small-scale landlords living in multi-habited compound houses is the dominant form accommodation. One of the Key Information lamented on the state of rental housing in Kumasi:

> *"…Very often the manner of construction and operation are outside the official building and land use regulations although in many cases have the traditional land rights granted by the traditional authorities…"*
>
> *"…landlords take a heavy lump sum rent advance take from*

> *tenants but does inadequate maintenance of the property…on the other hand, the tenants end up living in poor conditions and refuse to undertake repairs and maintenance work, in their minds; the premises are not their own…" **[Key Informant Interview, Rent Control Department]***

Adu-Gyamfi et al (2020) points out that Kumasi like other Ghanaian cities, operates a largely unregulated rental market relegating most of its functions to private property owners and renters. The original mandate the Rent Control Department (RCD), a public agency under the Ministry of Works and Housing presently works to maintain peaceful coexistence or reconcile misunderstandings between landlords and renters. The RCD executes this mandate by ensuring that both parties short-changed in terms of costs and quality of housing. The Key Informant at the RCD stated that:

> *"Often landlords and tenants go on some tenancy agreement of some sort, usually drafted by the landlord…when one party is aggrieved or feels the terms have not been met they come to our offices to lodge complaints. As a department it is our mandate to handle such issues, but we are hindered by financial and logistical constraints. This has created a public image of inefficiency" sometimes resulting in tenants and landlords seeking alternative avenues of resolution such religious and/or traditional leaders."*

4.3. The Rental Housing Market at the Community Levels – Ayigya and Ayeduase

The findings from the stakeholder consultation depict 3 major actors in the urban rental housing market in Ghana: Tenants and private Landlords who provide the demand and supply of housing; private rental agents who play a facilitative role and the public sector who play a regulatory role. Aligned with scholarly works on housing tenure in Ghana, narrative emanating from the mini stakeholder conference, FGDs and In-depth Interviews depict that private rental housing is the main tenure of housing in Kumasi. In line with findings from Nyarko (2006) as well as Dinye and Acheampong (2013).

4.3.1. The Supply Side

The provision of rental housing within Ayeduase and Ayigya presents a diverse range including owner occupiers, absentee owners, and caretaker landlords. The FGD of Landlords comprised of 10 participants; 8 males and 2 females, and between the ages 50-60 years. All FGD of Landlords participants had attended school with the minimum level Senior High School. Responses from FGDs with landlords suggest that their routes of becoming landlords include mainly through inheritance, the housing structure was initially intended for family residence and then converted into rental units, and investments to raise income.

> *"…my uncle passed away and I and my siblings inherited the house…we are all females and live with our husbands so we decided to rent out the house to maintain the house and take care of the larger family affairs"* ***[FGD Landlord, Female-Ayigya]***

> *"…the house used to be my parents' house, this is where I and my siblings grew up. My parents are both late and my siblings no longer reside in Kumasi. I have built a house of my own for my nuclear family…so I have converted this house into a homestel"* ***[FGD Landlord, Male-Ayeduase]***

Narratives from FGDs with landlords and in-depth interviews with rental agents depict that the landlords were self-employed or in public service and used the income from rental stock as a secondary source of income, and investments.

> *"…Some landlords are unemployed or retired from active service and so output from the rental stock serves as income. Others are working and the rent serves as safety net against precarious employment situations, meeting household expenditure, housing improvements…"* ***[FGD Landlords, Male-Ayeduase]***

> *"…it is a source of capital investment and rotation in business, and generally an investment for the next generation…"* ***[FGD Landlords, Male-Ayigya]***

> *"I purchased the land some years ago…at that time I was renting. I purposely developed the property to be able to rent out some sections and occupy part of the property"*

[FGD Landlord, Male-Ayeduase]

Majority of the landlords have 6-10 units in a compound to rent. The dominant type of rental unit is the compound house rented to multiple tenants and facilities are shared. Within the compound house are two main types of dwelling; single rooms and chamber and hall (See Ehwi et al., 2021). Other housing units include single room units with shared facilities, 1 bedroom with shared facilities, 2-bedroom apartment with private facilities but shared courtyard, 3-bedroom apartments with private facilities but shared courtyard and detached 3-bedroom flats. In addition to this range of rental units are hostels and homestels (See Table 2) that accommodate students from KNUST, University College of Management Studies (UCOMS), Jacksons Education College as well as National Service Personnel and job seeking graduates.

Table : Rental Housing Stock

Type of Units	**Ayeduase**	**Ayigya**
	Prices Per Month (GH₵)	**Prices Per Month (GH₵)**
Single Room (shared facilities)	3,00.00 – 4,00.00	2,00.00 -3,00.00
1 Bedroom Apartment	5,00.00 -6,00.00	4,00.00 – 5,00.00
2 Bedroom Apartment (shared courtyard)	8,00.00 -9,00.00	6,00.00 – 7,00.00
3 Bedroom Apartment (shared courtyard)	1,000.00-1,200.00	8,00.00-9,00.00
3 Bedroom Apartment (private courtyard)	1,3.00-1,500.00	1,000.00-1,200.00
Homestel	3,00.00-4,00.00	3,50.00 – 4,50.00

Source: Author's Field work, 2021

The large presence of student population, job seekers and young professionals within and around these communities has led to the emergence of new rental options such as the “homestel” and “single room-self-contained” to meet the preferences of the burgeoning urban population.

Table : Cost of Hostels in at Ayeduase

Room Per Occupancy	Prices Per Academic Year (GH₵)
One-room Occupancy	8,000 – 10,000
Two-room Occupancy	5,000 – 6,000
Three-room occupancy	3,500 – 4,000
Four-room occupancy	2,000 – 3,500

Source: Author's Field work, 2021

The prices of rental units (see Table 2 and 3) as indicated by the rental agents and landlords depend on level of newness the housing unit; the extent of furnishing and presence of facilities such as washroom, toilets and kitchenettes within the unit. In a bid to attract prospective renters particularly students some landlords have moved to the peri-urban areas to give their homes out for rent, whilst others have resorted to converting their existing housing units to include makeshift facilities.

> *"…I heard that my current facility which entails a washroom and bedroom used to be a one bedroom for the previous tenant…so my inbuilt bathroom and toilet facility have been separated by a mere plywood…"* ***[FGD Tenant, Student-Ayigya]***

> *"…Hostels as we have known them mostly are storey buildings specifically planned for student residency, with facilities such as study and leisure rooms to enhance learning and residence away from home… With the surge of student population, landlords have taken advantage and have turned their housing units into residential facilities which have come to be known as homestels…"* ***[In-depth Interview, Rental Agent-Ayeduase]***

According to the rental agents, the homestels lack the comfort, privacy and security that hostels exude. Nonetheless the tenancy duration for homestels is usually per annum and students can stay the entire year instead of two semesters as is the case with hostels. This kind

of housing unit is a relatively cheaper residence options (See Table 3) for students and graduates, and job seekers these options have emerged based on the high cost of hostel facilities in the area. The cost of occupying a homestels is between 10% and 15% cheaper.

Observations across all study participants is the recent trend of the sale and demolition of indigenous family houses, in an attempt to take advantage of the budding demand for modern rental units. Nonetheless, the provision of rental housing units is hampered by constraints related to inadequate finance, infrastructure, labour, building materials and the regulatory framework.

> *"…in the past, very few individuals preferred land in these areas, now there is a rush for land for various purposes causing the price of land to skyrocket…and where is the money!"* ***[FGD Landlords, Male-Ayeduase]***

> *"…most of the lands and properties are owned by families, and caution must be taken to ensure that all parties are agreement with the sale of such properties to avoid…"* ***[FGD Landlords, Female-Ayigya]***

> "…the process of acquiring the land tittle, approval and permit can be very cumbersome…I am currently experiencing this problem…and I have even lost count of the number times I have made trips to secure my building permits…" **[FGD Landlords, Male-Ayeduase]**

These findings are in tandem with Johnson & Tellis' (2008) observation that the barriers to entry include, but not limited to, the mercurial policies and regulations of the state. As such the consequent institutional underdevelopment has dire consequences on the flow of the desired resources for investment in the rental housing industry. The institutional environment includes both the formal (public) and informal (traditional authority) wielding power over 80 percent of the land in the country which take the form of the laws, regulations, property rights and normative structure of culture.

4.3.2 The Demand Side

A circumspect review of the 10 rental agent's client lists revealed that their services, are patronised by individuals of diverse occupations, educational levels, marital status and ethnic

backgrounds. The diversity in backgrounds has the inclination to determine the choice of rental unit preferred. Rental agents explained that individuals with smaller family sizes, young professionals, and students preferred rental units that had private facilities such as kitchenettes, bathroom, toilets, electricity meter, to ensure maximum privacy.

> *"…although we have a mix of clients; single individuals and newly formed families are our main clients. Usually their preference is for rental units that have private facilities such as water, electric meter, kitchen, bath and toilet. In instances where sharing is required prospective renters will insist that the number is limited to a maximum of 3 tenants…"* ***[In-depth Interview, Rental Agent-Ayeduase]***

On the other hand, the preference for low to middle income level households with large family sizes is skewed toward single room with shared facilities in spite of large household sizes due to high rents. Rental agents intimated that tenants weighed the opportunity cost of renting a smaller unit against the benefit of saving and investing towards building their own housing structures. For many households the benefits towards saving and investing towards homeownership superseded the cost of renting smaller units. These costs are presented in the form of poorly ventilated rooms as well as squabbles that generated from sharing facilities such as electricity meters, washrooms and kitchenettes.

> *"…despite the huge sums of money paid as rent advance, our housing structures are poorly maintained…if you take a critical look at the walls especially the ones at the back of the house you will notice they have cracks"* ***[FGD, Male Tenant-Ayigya]***

> *"…people will refuse to follow the duty rooster…they are aware it's their turn to sweep or scrub but will deliberately wake up late, some will intentional leave the house early to dodge responsibilities"* ***[FGD Tenant, Female Ayigya].***

Access to basic facilities may be described as moderate. Electricity bills are not included in the rent. In Ayigya most of the rental units use electricity which is metered by the main house and the electricity bill by dividing the total number of households in the compound house. As a

background, Dinye and Acheampong (2012) share that about 90 per cent of the houses in Ayigya were constructed between 1960 and 1980. During that period, emphasis was on building the extended family, hence majority of the houses are single storey traditional compound houses with shared facilities. Typical of slum communities, many of the residents in Ayigya reside in rental units that have no access to water, toilets and kitchenettes within the compound house. Water is usually gotten from small scale commercial water vendors within the community. Residents of Ayigya usually use the public toilets which are always unkempt, poorly maintained and require long queues to access. Rental stock in Ayigya is characterised building extensions or "attachments" in the local parlance (see Dinye and Acheampong, 2013). The effect of these building extensions is the overcrowding of buildings which hinders vehicular and pedestrian accessibility.

> *"…Walking through the community a difficult task as one might even lose his way or mistakenly enter the room of someone due to the extensions…".* ***[FGD Tenant, Female-Ayigya]***

On the other hand, in Ayeduase; an indigenous emerging urban area, many households share electricity meters with 2 or 3 households, many housing units have access to toilet facilities and pipe-borne water within their rental units. Rental units which do not have pipe-borne water had access to a borehole that is powered by an electric pump.

> *"…The community is opening up and services are improving around here…now you can get a vehicle from here straight to town and from town to here which was not the case some years back (Ayeduase)…besides most of us live and work within these environs…"* ***[FGD Tenant, Male-Ayigya]***

Tenant satisfaction among FGD participants was considered generally positive, because access to some basic facilities such as water and refuse disposal had improved over the years. Research participants also maintained that they had come to terms with the fact that the price of rent is in line with the location of accommodation, and facilities provided, especially since several of the traditional compound houses had been upgraded to flats and apartments.

Despite the challenges faced by the dwellers in Ayigya, they still preferred to live there due to the associated economic benefits. FGD of Tenants revealed:

"…Majority of the food sellers in Susanso, Bomso, and KNUST are from Ayigya. Some of the workers such as the labourers, cleaners at KNUST live in Ayigya and surrounding communities…" ***[FGD, Tenant-Ayigya]***

"…here when you try any economic activity and you are dedicated it is successful…as a result people migrate from the North to live with relatives at Ayigya to engage in economic activities in and around the environs of KNUST…" ***[FGD, Tenant-Ayigya]***

4.3.3. Regulation of the Rental Market at the Community Level

Since the 1960s, renting in Ghana has been regulated by the Rent Act, 1963 (Act 220). It contains provisions not only for setting rents but also for ordering the relationship between landlord and tenant. Section 19(2) of the PNDC Law 138 amended Section 25(5) of Act 220 makes it an offence for any landlord in Ghana to demand more than 1-month AR for shorter tenancies and 6 months for longer tenancies.

Furthermore Section 4 of the Rent Control Law 1986 (PNDCL 138), states that "every landlord of any residential accommodation shall register with the Rent and Housing Committee each lease within 14 days of entering into the tenancy agreement". The Committee also serves as an avenue where tenants and landlords could voice their concerns. Section 7 of the same law states further that "complaints or an action by a landlord against a tenant in respect of a residential accommodation whether single or two-roomed shall not be heard by the Rent and Housing Committee unless it is satisfied that the landlord has fulfilled the obligations imposed on the landlord by section 5.

Section 5 obligates landlords of residential accommodation to:

1. Issue to each tenant of the accommodation a rent card specifying the following; The name and address of the landlord; The name and address of the tenant; the amount of rent payable by the tenant.
2. Furnish to the nearest Rent and Housing Committee a list of the names of the tenants and the actual rents paid by each of the tenants. According to section 6 of the Rent Control Law 1986, the enactment of a tenant or recovery of possession from a tenant in respect of a residential accommodation shall not be entertained unless:
   I. There's a genuine intention to recover possession of the accommodation for the personal occupation as a dwelling room or rooms for the landlord, a

member of the landlord's family or any person in the landlord's full-time employment.

ii. Or that the accommodation is reasonably required by the landlord to be used by the landlord for business purposes.

3. Once a landlord makes an application for the ejection of a tenant or the recovery of possession based on the reason stated above, the Rent and Housing Committee may call for documentary evidence or verification from the landlord and may, if satisfied, make an appropriate order.

Two main observations are made with the above. First, consistent with several studies, (Asante et al., 2018; Gavu & Owusu-Ansah, 2019) landlords in study communities flout this provision of Act 220 and PNDC Law 138. Generally, in the two communities the rental market operate as follows:

- Management of rental units is done by landlords: Tenants pay rent a rent advance of 2 years directly to the landlord, in the absence of landlord the caretaker landlords receives the sum on behalf of the landlords. Hostels and homestels are paid annually and flat rates are issued per annum.
- Tenant Selection is based on ability to pay: Majority of the landlords do not have target tenants; hence tenant selection is based on the willingness and ability to pay for a rental unit. A few hostel/homestel owners however specified that they preferred female tenants because male tenants seldom keep their units neat, make a lot of noise, and may encourage "perching".
- Identification of tenants is mostly via Rental Agents: Tenants mainly find their accommodation through rental agents, or through referrals from family members or friends.

Landlords insist on the payment of two years advance rent, which are paid by new and existing tenants. The positionality of the body of literature suggests the gap in supply of rental housing units in Ghana and the inefficiency of the state apparatus to protect tenants account for the total disregard of the laws (See Asante et al., 2021).

> *"Often landlords and tenants go on some tenancy agreement of some sort, usually drafted by the landlord…when one party is aggrieved or feels the terms have not been met they come to our offices to lodge complaints. As a department it is our mandate to handle such issues, but we are hindered by*

[3]Refers to a situation where one or more of the tenants doesn't have a direct contract or tenure with the landlord or owner of a property. It may be for some form of payment or free occupancy.

financial and logistical constraints. This has created a public image of inefficiency" sometimes resulting in tenants and landlords seeking alternative avenues of resolution such religious and/or traditional leaders…" ***[Key Informant, Rent Control]***

The above narrative bestows the second observation that there is generally limited knowledge (on the part of both tenants and landlords) regarding the rental laws and the avenues to seek redress. As a result, tenants fall on traditional leaders and Assembly persons when a problem is encountered.

"…It has become a norm for residents within our communities to fall on us to mediate on rental problems on their behalf. Sometimes the individuals are accompanied by friends, relatives and other acquaintances…" ***[Stakeholder Conference, Traditional Leader]***

… Mostly tenants seek our assistance pleading on their behalf relating to an extension of the period to pay rent among other issues. There are few instances landlords seek our assistance to in speaking to tenants pertaining to some behaviours they are displeased about…" ***[Stakeholder Conference, Assembly Person]***

Our interpretation of the tenancy agreements between landlords and tenants is that, they merely serve as a documentation of transactions between the landlord and tenants as well as rules and regulations sanctioned by landlords which when defaulted result in eviction.

5.0. Conclusion

The paper primary set out to present an account of the basic characteristics and operation of the rental housing market situation in Kumasi as a case study of Ghanaian cities. The rental housing market in the city is complex, unstructured and informal. From a free market perspective, it is distorted since the supply of housing falls short of the demand which continues to be on ascendency. The underlying causes include rapid population growth,

increased urbanisation and high population concentration. The rental housing typology comprise traditional compound houses with shared facilities, apartments with separate internal facilities but a shared courtyard, semi-detached dwellings with separate courtyard, detached housing with separate internal facilities and hostels/homestels for students and other youth.

From the supply side, the key actors comprise owner occupier, absentee and caretaker landlords who rent their premises mainly as a main and/or secondary source of income, and for investment purposes. On the demand side constitutes individuals, households and personnel of corporate institutions. The intermediaries between the supply and demand side actors are the rental agents who facilitate and or assist in the access to each other, interaction and in some cases their transaction processes.

The management of the rental units are undertaken by landlords. Tenants selection is based on the ability to pay. A few landlords prefer female tenants because their male counterparts have the tendency of noise creation, not cleaning the premises and encourage perching. Tenant preference for rental units is mostly for ones that have private facilities, incentivising landlords to remodel existing units to meet this penchant at a higher cost.

The government has since the 1960s through the Rent Act, 1963 (Act 220) sought to promote good landlord and tenant relationship and moreso to prevent the latter from undue extortion by the former. Nonetheless, inadequate performance of the Rent Control Department due to financial and logistical support has led to unfavourable functional environment for the rental housing sector exhibited by advance rent payment and limited knowledge of rent laws and avenues for seeking redress.

This paper makes 3 main contributions to conventional literature. First, it unpacks the nature and operations of the rental housing sector in Ghana through a case of Kumasi. Second It provides an outline of the key actors and the roles they perform in the market system. The study reveals the emergence of non-traditional rental housing units' hostels/homestels as well increasing preference for private facilities met by high rents at the discretion the landlords. Agreeing with several studies is the state's inability to play its regulatory role (as postulated by the market economy) due to limited financial and logistical support. Consequently, an important entry point will be deepening the collaboration between the city authorities and central government in urban development policy, strategy and practice.

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AN INVESTIGATION INTO THE CHALLENGES OF "FINANCIALISING" RENTAL HOUSING IN ZAMBIA

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Abstract

"Financialisation of rental housing" is a process to transform rental housing into a financial asset. A number of explanations assert that this process includes the linking of housing to financial markets. Because real estate (including houses) is often financed from borrowed funds, this creates a close relationship between rent, construction costs and bank lending rates. Experiences from a number of African countries, though, shows that this process of "financialising" rental housing has been sluggish. Many still suffer from a pre-1990 state where public housing was the major form of accommodating its citizens. Evidence across Africa shows that financing of housing is unsustainable without private sector involvement, resulting in high deficits. Zambia's housing deficit is currently estimated at 2.8 million units, thus investigating the challenges of moving housing from simply being a public good to a financial asset becomes paramount. It thus examines the question: what are the key challenges preventing the transformation of housing into a financial asset? Amongst many challenges, the study finds that there is a financing gap, between rental income and mortgage repayments, in the Zambian housing market. This is preventing the private sector from getting fully involved in the production of houses. This paper used cross sectional data, collected from financial institutions and real estate firms. The paper points to the need for the reduction of the cost of borrowing and increase in deposable incomes as the twin measures to propel the transformation of housing into a financial asset.

Keyword: Financialisation, Housing finance; financing gap, rental market; Zambia

1.0. Introduction and background

"Financialisation" is defined as the "increasing dominance of financial actors, markets, practices, measurements and narratives at various scales" (Fields, 2015; Aalbers, 2016; Kaika et al., 2016; Soederberg, 2018; Wijburg, 2021). Fields and Uffer (2016) talk about "financialisation of rental housing" with reference to the use of private equity real estate investment. The concept is also linked to "privatization, marketisation and commodification" of assets (Jacobs and Manzi, 2019). The examination of this concept helps to understand the current trajectory for most African countries with regards to housing and financial markets, as many have moved from a time when housing was mainly a public good to now being an investment asset. This process has implications on how housing development is financed on a continent grappling with high deficits (Mukhtar et al., 2017; Stren, 2018; Marbin, 2021).

Literature reviewed for this paper (cf. Harvey, 1982; Haila, 1988; Christophers, 2010; Fields, 2015; Aalbers, 2017; Wijburg and Aalbers, 2017; Wijburg et al., 2018; Nethercote, 2020; Hulse et al., 2020; August, 2020, Chen et al., 2022; Aveline-Dubach, 2022) particularly on experiences in UK, US and Europe, shows that the road to linking housing to financial markets is riddled with challenges. For instance, experiences in these countries show "start-stop" attempts to transform housing into a financial asset (Fields and Uffer, 2016). This study though noted that very few studies have been done in African countries where this struggle is more pronounced. One clear change in the housing sector is that more and more governments are passing the responsibility of providing affordable housing to the private sector, which then opens up the sector to financial markets and foreign capital.

Experiences from a number of developing countries reveal that the process of "financialising" rental housing has been sluggish (Peppercorn and Taffin, 2013). Many still suffer from a pre-1990 state where public housing is the major form of accommodating its citizens (Mukhtar et al., 2017; Stren, 2018; Marbin, 2021). Evidence across Africa shows that provision of public housing is unsustainable without private sector involvement, resulting in high deficits (Gunter and Scheepers, 2012; Bah et al., 2018). This paper investigates the challenges of moving housing from simply being a public good to a financial asset in the Zambian market. It thus examines the following question: what are the key challenges preventing the transformation of housing into a financial asset?

Zambia, like most African countries, is experiencing challenges in the provision of decent and affordable housing with the majority (about 70%) of its urbanites reported to be living in informal housing in unplanned settlements (Basila, 2019; Makashini et al., 2021). Besides

failure by government to provide sufficient housing, these challenges are also because of inefficiencies of the housing market, lack of affordable finance and population increase (PMRC, 2018). For the low-income earners, high cost of land and lack of cheap finance compounds the problem.

On the financial market side, statistics reveal that most Zambian citizens do not use the financial systems; with financial inclusion estimated at 59.3% in 2015, a significant increase from 37.3% in 2009 (Finscope, 2015). Despite this increase in access to financial services, 75.3% of Zambian adults still avoid borrowing in preference to saving for any investment (Finscope, 2015). Only 29.8% borrowed in 2015 and of the people that did not borrow, at least 48% were concerned that they may not meet their repayment obligations. The Finscope survey further revealed that in 2015 only 2.3% borrowed for buying or building a house to live in. These findings have serious implications for real estate investments and the drive to transform housing into a financial asset. Hence, this paper examines key challenges preventing the transformation of housing into a financial asset in Zambia.

2.0. "Financialisation of rental housing": a literature review

The theorization of "land as a financial asset" essentially re-appears in the literature with Harvey (1982) and Haila (1988). Harvey (1982), arguing from a Marxist political economic perspective, re-ignite the debate on the place of property in capital accumulation mainly to re-contextualise Marxi's theories in a changed world. This prompted studies such as DiPasquale and Cummings (1992) and Harloe (1995). In recent times, Fields and Uffer (2016) and Christophers (2010) attribute this resurgence to the rise of financial services, expanded real estate sector and redevelopment on inner cities making the sector more amenable to capital flows. Scholars (cf. Harvey, 1982; Haila. 1988; Harvey, 1982; DiPasquale and Cummings, 1992; Harloe, 1995; Weber, 2002; Downs, 2009; Christophers, 2010; Fields and Uffer, 2016) thus argue that starting from the 1980s, real estate has progressively transformed from a mere public good to a financial asset due to the flow of private capital into the sector. The theoretical debate thus centres on the old theories of the "place of property" (Denman, 1978) and "general theory of capital" (Marx, 1867), but now in a financially connected world.

Private rental is an important subsector of the housing market and yet its structure and financing challenges are not well understood. A number of recent studies has thus focused on examining the process of "financialisation of rental housing" (Fields, 2015; Nethercote, 2020; Aalbers, 2017; Wijburg and Aalbers, 2017; Wijburg et al., 2018; Chen et al., 2022; Aveline-Dubach, 2022; Hulse et al., 2020; August, 2020) as most countries make attempts to transform social/public housing into rental housing as a financial asset.

A number of studies show that re-emergence of the drive to transform housing into a financial asset can be traced from the 1980s when land was again starting to be seen as a "financial asset", mainly in commercial real estate (Weber, 2002). Studies argue that by the 1990s, multifamily rental housing had become a financial asset in the developed markets of the US and Germany due to the rise of financial services (Bradley et al., 1998; Fields and Uffer, 2016). This then attracted external capital, particularly for commercial property. Studies further argue that because of structural changes in economies, mortgage markets have changed from facilitating borrowers' access to credit to facilitating processes of global investment (Aalbers, 2008, 2016; Fields and Uffer, 2016). Financial integration of real estate is argued to have heightened after 2000 when central banks drastically reduced interest rates; reduction in interest rates often has the effect of adding liquidity to the economy, increasing asset values and profitability (Downs, 2009; Fields and Uffer, 2016).

A number of studies (cf. McGrew and Held, 2002; Aalbers and Holm, 2008; Crump, 2002; Wyly et al., 2010; Egner and Grabietz, 2018) have been conducted to examine the state of rental housing in the US, UK and most Western Europe. For instance, Egner and Grabietz (2018) argued that housing policy re-emerged on the German political agenda after a drastic increase in rental prices in major cities. These studies have revealed that most developed countries have been on the path of moving from public to private housing for a long time with varying successes. For instance, Fields and Uffer (2016) compared how private equity real estate investment was reshaping the rental housing markets in New York and Berlin. Financialisation of the housing asset thus hinges on investment banks, private firms and other players managing real estate private equity funds that invest directly into property or property-based securities such as Real Estate Investment Trusts (REITs). The study concluded that financialisation does not lead to similar outcomes. They thus argue that capital adapts to changing global and local conditions.

The role of private investment and market-based housing finance remains minimal in Eastern Europe (Peppercorn and Taffin, 2013; Bethlendi and Mérő, 2020). This is especially evident in

formerly socialist-communist oriented countries (Makszin and Bohle, 2020). For instance, the UNECE report of 2019 noted that the systems of housing finance, construction, maintenance, modernization and management in Belarus was at least 75% dominated by State entities, particularly State Owned Enterprises (SOEs) and banks (Peppercorn and Taffin, 2013). Only after 2010 did the country see a movement from a State-rental housing model to a market-based housing model. Peppercorn and Taffin (2013) further reports on rental housing in emerging markets arguing that rental residential housing has remained an "orphan child" while governments focuses on home ownership. The study further argued that if properly developed, rental markets would be a formidable route to providing affordable and decent housing.

Table 1: Housing Tenure in selected countries

Continent	Country	Owners	Renters
Africa	Egypt	69	31
	South Africa	77	22
Asia	China	84	16
	India	87	11
	Thailand	82	18
Americas	Bolivia	60	18
	Brazil	73	17
	United States	67	33
	Uruguay	62	17
Europe	France	57	40
	Germany	43	57
	Netherlands	57	43
	Switzerland	37	63
	United Kingdom	69	31

Source: Bah et al. (2018)

In this financialisation process, the link between market values and loans is also important. For instance, Gwinner and Sanders (2009) found that high Loan-to-Value (LTV) and Debt-to-Income (DTI) ratios had contributed to the financial crisis in 2008. Therefore, in markets with reduced earning capacity of participants, debt levels will often be higher relative to their incomes. For instance, in most emerging markets, mortgage lending is typically less than 20% of GDP compared to 40% to 100% in developed countries (Gwinner and Sanders, 2009).

The link between housing and financial markets is weak in most African countries (Bah et al., 2018; Muhammad and Johar, 2019; Finscope, 2020). Reports by CAHF show that in most countries this starts with the use of financial services. Bah et al (2018) shows that double digit

interest rates on residential mortgages and housing loans is the norm in many African countries; the only countries cited for favourable rates were Morocco, Tunisia and South Africa. These high interest rates are linked to high inflation rates and currency depreciation (Bah et al., 2018), with serious impact on housing affordability. Bah et al. (2018) thus reports that less than 2% of the populations in Botswana, Malawi, Tanzania and Zambia use mortgages to buy houses. Most studies show that African countries have not fared well on this transformative path. For instance, studies show that in Rwanda the majority (75%) built their houses with only 17% buying complete houses (Finscope, 2020).

In most African and developing countries with similar linkage challenges of the housing and financial market, other ways are used to bridge the supply issues. Site and service and incremental building have been some of the major modes (Adeyeni et al., 2016; Sanga, and Lucian, 2016; Wainer et al., 2016; Amoako and Frimpong-Boamah, 2017; Mselle and Sanga, 2018; Adebayo, 2020). Mselle and Sanga (2018) confirm that owner-built incremental housing strategy has been used in developing countries for many years, with varying results. The study examined construction constrains in Tanzania. Goethert (2010) also reports on the use of incremental housing in Haiti. On the rental side, provision of housing by individuals owning one or two houses is the primary way of providing private rental housing around the world (cf. Milligan et al. 2013). However, studies across the globe still show that affordable housing, whether for sale or rent, has been on the decline (Wulff et al., 2011).

3.0. Methodology

The paper used a combination of quantitive and qualitative approaches. In order to answer the research question, the following information was required: lending rates and other investment (such as Treasury Bills and Government Bonds), monthly housing rentals, monthly mortgage repayment, sale prices and property yields. Cross sectional data was thus collected from Bank of Zambia database (2012 to 2022), private real estate firms and financial institutions. This enable the study to, not only analyse housing rental and mortgage repayments, but also compare with other investments that compete for limited financial capital. Sale prices, monthly rent and yields were collected for 45 houses using a standard template sent to firms. This data was then arranged from low to high value properties (or low to high cost houses). Housing complexes/clusters were disregarded to avoid distortion of data. A mini database, using SPSS, was created to enable analysis using graphical and statistical tools. This data was specific to the city of Lusaka.

4.0. Findings and Discussions

The key objective of this study was to examine the challenges preventing the transformation of housing into a financial asset in the Zambian real estate market. The main reason for this investigation is due to the realization that government alone cannot sufficiently finance housing development for its citizenry; hence private sector involvement becomes are important part. For instance, current statistics show a huge housing deficit estimated at 2.8 million (UN Habitat, n.d.) with an annual production of 73, 000 units per year. This far less than the expected units of 222,000 per year (ZIPAR, 2018). This stock is divided into 64% traditional and 36% formal urban housing. As at 1996, this production level had resulted in a shortfall of 1.5 million housing units (GRZ, 1996). However, current estimates show that this deficit has now increased as shown above. Failure to keep pace with the demand is projected to result in a deficit of 3,328,904 units by 2030 (ZIPAR, 2018). A focus on Zambia thus confirms the challenges seen in the literature (such as Bah et al., 2018) across Africa.

This housing backlog is better understood by a brief historical re-count on the country's struggle to move from public housing to a functional private real estate market. From as early as 1964, that is at independence, private rental housing has had no full support through government policy. The focus has been on home ownership and employment tied-housing (Schlyter, 1998; Mashamba, 2018). This became evident in 1975 when the state banned private provision of rental housing (Stren, 2018) and placed this responsibility on government, local authorities, state owned enterprises (called parastatals) and the Party (then the United Independence Party – UNIP) (Kaunda, 1975). This aspiration was then captured in National Development Plans (NDPs); starting with the Transitional National Development Plan (1965-1966) up to 1991. During the period 1975 to 1991, local authorities became the main providers of rental housing in the country (Phiri, 2022). Private housing finance through mortgages or any means was virtually nonexistent. As shown by Makasa (2020) the performance of these development plans has been dismal.

By 1991, when the liberation party UNIP lost power, the housing situation was already getting dire in the country, hence the new Movement for Multiparty Democracy (MMD) administration started emphasizing the role of the private sector in the production of housing (MMD. 1991). The Housing Policy launched in 1996 thus set out to reduce the identified housing deficit of 1.5 million houses (GRZ, 1996). The new administration's hope was to achieve this by creating an “enabling environment” for the participation of the private sector

in economic activities, with the privatization programme as its biggest flagship (MMD, 1991). Home ownership was again re-emphasized, with the selling of houses to sitting tenants as the first step. Although this was meant to empower citizens with homes, it also signaled the re-emergence of the private rental housing market as most recipients opted to let or sell their properties.

To complement local authorities efforts, government also identified provision of a "site and services" and "increment building" as another major mode of supporting home ownership. As discussed in the literature (cf. Adeyeni et al., 2016; Sanga, and Lucian, 2016; Wainer et al., 2016; Amoako and Frimpong-Boamah, 2017; Mselle and Sanga, 2018; Adebayo, 2020; Bah et al., 2018), this has become one of the major means of providing housing in most developing countries (including Zambia) where provision of public housing has failed.

The summary of this historical recount is that from independence in 1964, housing in the urban areas was mainly tied to employment with the main providers being government (local and central), State Owned Enterprises (SOEs) and the private sector. This continued to be the case even after 1975 when major reforms on land were made, including the ban of the private sector from providing rental housing (Kaunda, 1975). At that time, few people owned houses. Reforms after 1991 re-emphasized home ownership through a Presidential Empowerment Initiative that saw the selling of previously government and SOEs houses to selling tenants (MMD. 1991). In addition, the private sector was also encouraged to get involved in the development of housing for the rental market; however current statistics looked at earlier show that this has not yielded much as the deficit keep growing year by year (UN Habitat, n.d.).

In addition to restrictions on the private real estate market, the 1975 reforms also affected the financial systems such that by 1991 the sector was also reeling from years of State domination in the economy. Figure 1 below illustrates the disjoint between the annual inflation rate and lending rates from 1971 to 1994 brought about by state regulations of the financial sector. Specifically, annual inflation was consistently above savings and lending interest rates from 1973 up to 1994. For instance, annual inflation was at 12% in 1980 while lending rates to residential and commercial property fell between 8% and 10%. However, by 1990, inflation had raised to 110% while lending rates rose to between 30% and 34%. By 1992, inflation rate had peaked at an all-time high of around 200%. The implications of inflation rate being way above lending rates are vast. From a general understanding of Fisher's (1930) classical hypothesis on the relationship between interest rates and inflation, the relationship experienced from 1971 to 1995 signified negative real rates of interest; this made borrowing for business very expensive.

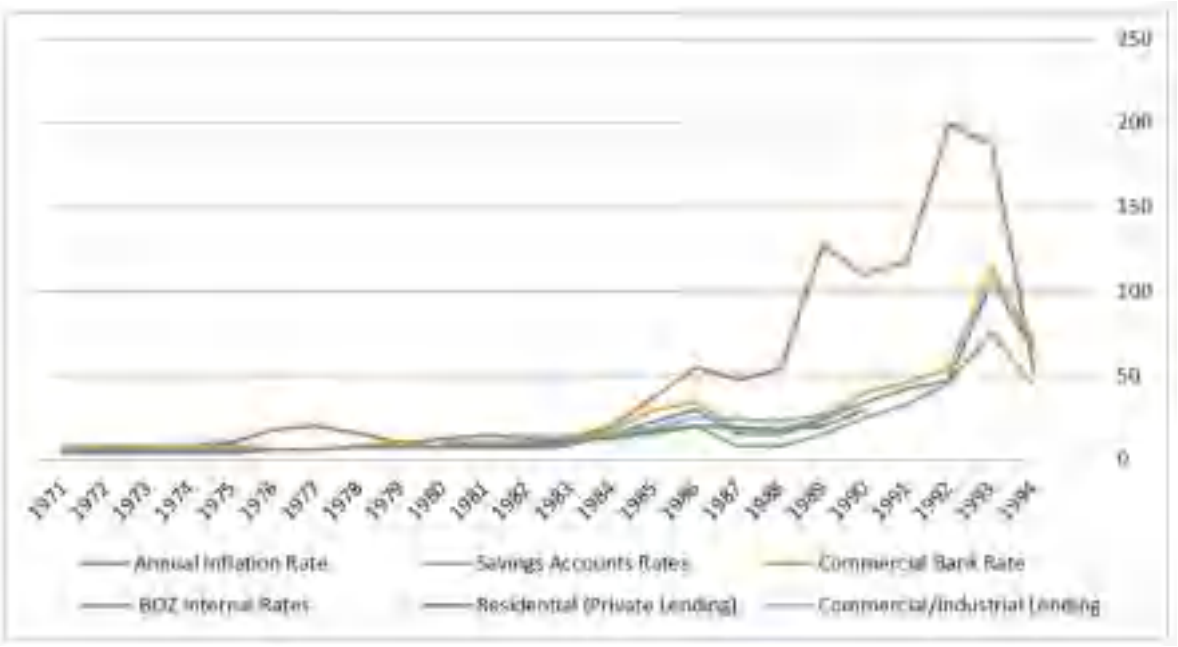

Figure 1: Bank and Lending Rates – 1971 to 1994 (Various Bank of Zambia and Zamstats documents)

Zambia passed it first Housing Policy in 1996, which was later revised in 2007 with the current version being a 2021 one. Despite a provision of allocating 15% of the national budget to housing, this has not happened from 1996 (GRZ, 1996). This has left much of the responsibility to produce houses for rental purposes with individuals and the private market. However, current statistics show that there has been no serious improvement in tackling the housing deficit as earlier noted (UN Habitat, n.d). Conversely, Zambian towns and cities have grown more in informal settlements with an estimated 70% of the urban population living in these areas (UN Habitat, 2012). This point to the urgency to investigate challenges faced by the private sector concerning financing housing development in the country.

Despite a reverse relationship from that experienced from 1971 to 1994, interest rates in the country have remained relatively high while rental levels have remained low; posing a challenge for the "financialisation of rental housing" in the country. For instance, Figure 2 shows average lending rates from 2012 to 2022 dropping from the highs of the 1990s to around 23% by 2012 but then took another upward swing averaging at 25% by June 2022. When compared to interest rates in developed real estate markets, this is still too high to support the mortgage market; thus supporting Bah et al. (2018), Adeyeni et al. (2016), Sanga, and Lucian (2016), Wainer et al. (2016), Amoako and Frimpong-Boamah (2017) and others on challenges of incremental housing in developing countries. FinMark reports that lending rates rose to as high as 45% in 2001 and dropped to 28% in 2005 (Melzer, 2007). Interest on

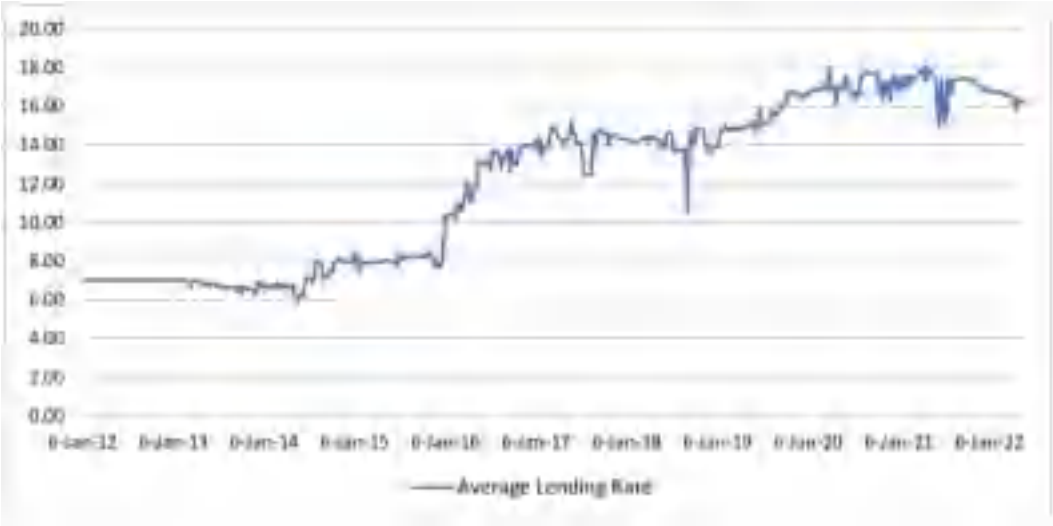

Figure 2: Average Lending Rates (2012 – 2022) (Source: Bank of Zambia database)

home loans currently range between 19% (at Absa Zambia) and 25% (at Standard Chartered Bank).

The action to make housing a financial asset means that it will then be able to compete for investment capital with other alternative assets such as Treasury Bills and government bonds. Statistics for Figure 3 below showed that yields for Treasury Bills and government bonds ranged from 7.14% on 91-day treasury bills and 16.23% on a 15-year government bond in 2012. These too have risen to 9.30% and 26%, respectively by June 2022. In fact, both Figures

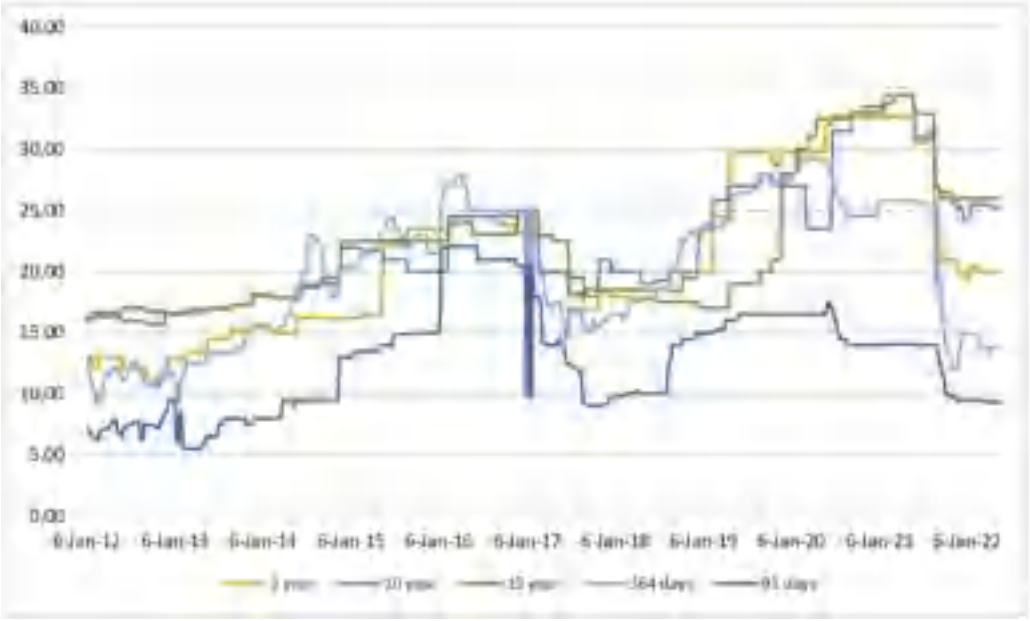

Figure 3: Treasury Bills and Government Bonds (2012 to 2022) (Source: Bank of Zambia)

2 and 3 show an upward trend from around 2017 with a peak in 2021 before dropping to current levels in 2022.
An overall observation from these statistics is that Zambia has for many years struggled to bring interest rates to levels that would support private sector borrowing. This has implications on the "financialisation" of rental housing. In fact, many studies by the Centre for Affordable Housing Finance in Africa (CAHF) point to the high cost of finance as one of the major hindrances to the growth of the private sector (CAHF, 2020, 2021). Figure 4 below explains what this means for the rental housing market.

As earlier noted, the sale of most government and council houses energized the emergence of the private sector in Zambia. In addition, the allocation of plots to individuals also means that resources have to be found to support this building process; however getting loans for home building either for own occupation or letting purposes has proved to be a challenge. A simple example will illustrate this point. Getting a loan to purchase or build a house for rental purposes is one sure way of investing in the real estate market and yet financing institutions are reluctant to support this process. A loan of K650,000 over 20 years at 19% per annum to build a three bedroomed house in Chalala, Lusaka will require a repayment of K10,384 per month; and yet the maximum rent this house can fetch is about K4,500 per month, creating a financing gap of K5,884.00. The result has been that most people opt to build incrementally (Munshifwa et al., 2017) through self-building initiatives by using funds from small personal loans, savings, salaries/wages and other incomes. Figures 4 and 5 provide a full picture of this situation.

Figure 4 represents data collected from real estate firms on sale prices, monthly rentals and yields from different areas of Lusaka. These findings show clearly that as property prices increase (from low to high cost areas), yields decrease. Delving into the specifics, this data shows that as one moves from the low cost areas of Chilenje through the medium cost to high cost areas of Roma. Kalundu and Sunningdale, returns on residential investments drop. In terms of rent, this comprised K1700 - K4500 per month (low to medium) and above K4,500 to K15,000 per month (medium to high). Furthermore, graphical analysis shows a drop in terms of yields as one moves from low cost to high costs; including that rentals plateau at a certain level. This is consistent with the theory that rent is often a function of the earnings of a household (Jordaan et al., 2002), therefore in a country where workers' earnings are low, there will be a ceiling in terms of how much rent can be charged. The implication of this analysis is that if, on the financial market, interest rates are above this ceiling, it will be difficult to service mortgage repayments from rental income. Put plainly, an investor cannot finance

rental housing through borrowed money in such a situation; hence posing a challenge to the financialisation of rental housing drive. This assertion is further affirmed in Figure 5, which shows a widening gap between monthly loan repayments and rent as one moves from low to high-income properties. Figure 5 plots monthly loan repayments at 19% over 20 years and monthly rent.

The general observation from this analysis in Figures 2, 3, 4 and 5 is that the biggest challenge for the Zambian rental housing market is an affordability one. It is clear that rent is not able to service mortgage loans, creating a financing gap which widens as one moves from low value

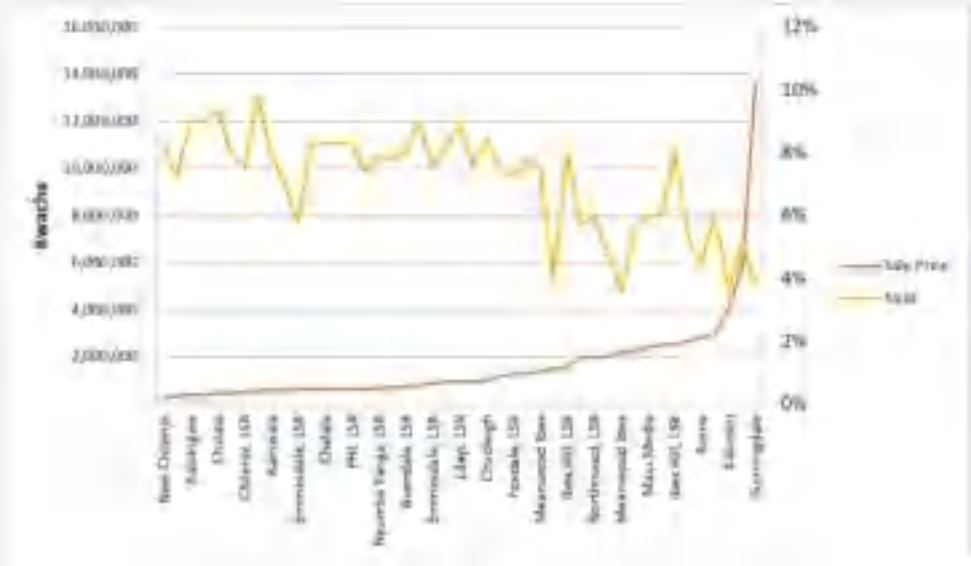

Figure 4: Sales Prices and House Yields for Lusaka (Source: Data from various Real Estate Firms)

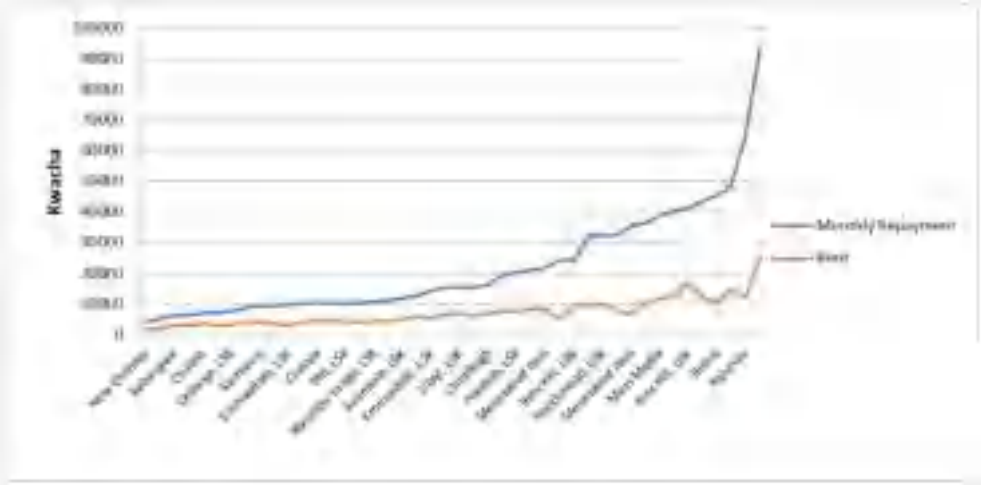

Figure 5: Monthly loan repayments versus rent (Source: Data from various Real Estate Firms)

properties to high value ones. In a market with this picture, converting rental housing into a financial asset to compete for capital with alternative investments becomes a challenge.

The graphical relationships seen in Figures 2, 3, 4 and 5 above were further confirmed using statistical analysis. The regression model results in Table 2 confirms the negative relationship between residential property sales prices and yields. For instance, the results show R-squared of 0.372 depicting the impact of "sales prices" (independent variable) on "yields" (dependent variable). The standardized Beta of -0.610 not only confirms this relationship but also shows that it is a negative one; supporting the graphical analysis seen earlier that as prices increase from low to high cost properties, yields fall with implication on financing using borrowed funds. The F-value of 25.465 and *p-value* of 0.000 further confirm that this relationship is significant at 95% confidence interval.

Regression weights	Beta Coefficient	R^2	F	p-value
Sales Prices → Yields	-0.610	0.372	25.465	0.000

a. Dependent Variable: Yields
b. Predictors: (Constant), Sale Price

Table 2: Regression Model results

The implication of these findings is that rent charged on a house on the higher end has a ceiling that is generally determined by the purchasing power of the local market. On the other hand, property owners are able to negotiate relatively higher rent because of high demand for lower end houses. The major conclusion drawn on key barriers to financialisng rental housing in Zambia is that the difference between residential yields and lending rates is a deterrent to would-be investors to the subsector. This is underpinned by the reality of low-income levels amongst potential renter. Zambia is classified as one of the low-income countries. Thus, affordability problems imply challenges in the level of incomes in the country. Since the cost of production is unavoidable, the solution would then be to improve the incomes in the country to levels that can support borrowing; this explains why many developers are not able to borrow from financial institutions to build for ownership or rental purposes

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5.0. Conclusions and recommendations

This paper set out to examine the key challenges preventing the transformation of housing into a financial asset. The study finds that the major change is the financing gap, between rental income and mortgage repayments, which make it difficult to obtain a loan to investment in rental housing. The result is that private sector involvement in this housing production, as an alternative to public housing, has remained low. With limited government funding to find the sector, this has resulted in a rise in housing deficit from 1.5 million in 1996 to an estimated 2.8 million currently. Housing development has largely remained with individuals, and a small part of the real estate market, as the major source of finance from small personal loans, salaries/wages and personal savings.

In order to improve this linkage between rental housing and financial systems, and in the process eradicate the housing deficit, government policy should consider a number of policy measures. Some of these measures should focus on reducing the cost of borrowing; encouraging and supporting private developers (for example, through the provision of land); creation of more employment and business opportunities; and effective implementation of the national housing policy.

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INTEGRATING LAND VALUE CAPTURE INTO INFRASTRUCTURE INVESTMENT PLANNING IN SOUTH AFRICA: A LOCAL GOVERNMENT FRAMEWORK

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Abstract:

South Africa experiences fiscal constraints and economic contraction as a major hindrance to delivering the much-needed infrastructure development to meet the needs of a growing population and rapid urbanisation. The traditional method of funding infrastructure development by the government is overwhelmed and there is an urgent need to use alternative funding models such as Land Value Capture. Currently, this process is disintegrated in South Africa, therefore the aim of this study is to draw up guidelines towards the successful implementation of Land Value Capture using planning gain and investment theories. To do this the study analyses key relevant documents such as South African legislation and policy documents to make a comparison between conceptual guidelines developed and the findings of the document analysis. The study adopted a qualitative method in which five key relevant documents were randomly selected based on conceptual framework and research questions and analysed using content analysis and the conceptual guidelines are used as themes. Findings from document analysis are discussed how they compare, support and conflict with conceptual guidelines to draw up a more refined and evidence-based guidelines towards successful implementation of Land Value Capture. The relevance of this study lies in the fact that the South African government need to expedite

infrastructure developments previously curtailed by apartheid systems. As urbanisation rises rapidly, the South African government is required to find effective ways to drive economic growth that is anchored in the imperatives of inclusive cities. The paper finds that there is significant inconsistences on how LVC is currently being implemented (according to the document analysis) and how the conceptual framework in this study appraise it to be implemented, it further recommends a guideline towards successful implementation.

Words: Land value capture, Cost recovery, Infrastructure investments, Government affordability, Value creation, Public-Private-Partnership, Local government.

1.0 Introduction

Rapid population growth throughout the developing world has outstripped the capacity of most cities to provide infrastructure and adequate basic services (Tsoka, 2014; Statista, 2022). It is projected that Africa's total population would reach 2,5 billion by 2050. In 2020,

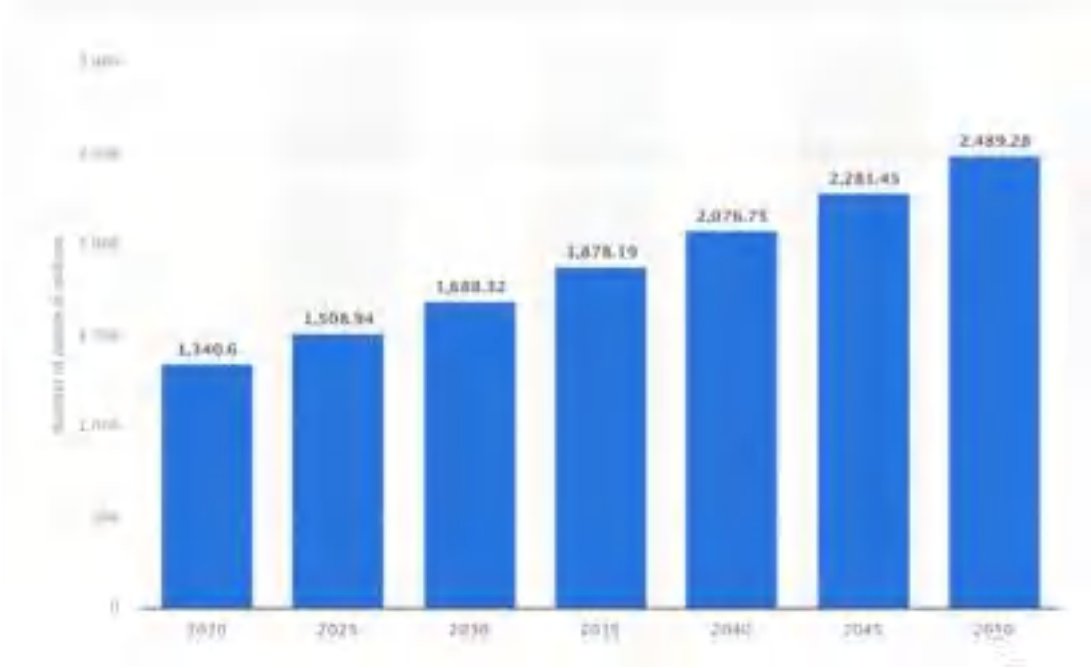

Figure 1: Forecast of the total population of Africa From 2020 to 2050
Source: Statista, 2022

the continent had around 1.34 billion people, with Nigeria, Ethiopia, and Egypt topping the list.

Adding to this pressure, rural to urban migration has increased significantly. The number of

people living in urban areas in Africa (currently 472 million people) is projected to double over the next 25 years, averaging a 39% urbanisation rate (Blimpo and Cosgrove-Daves, in Africa Development Forum, 2019). As urbanisation rises rapidly, South African government is

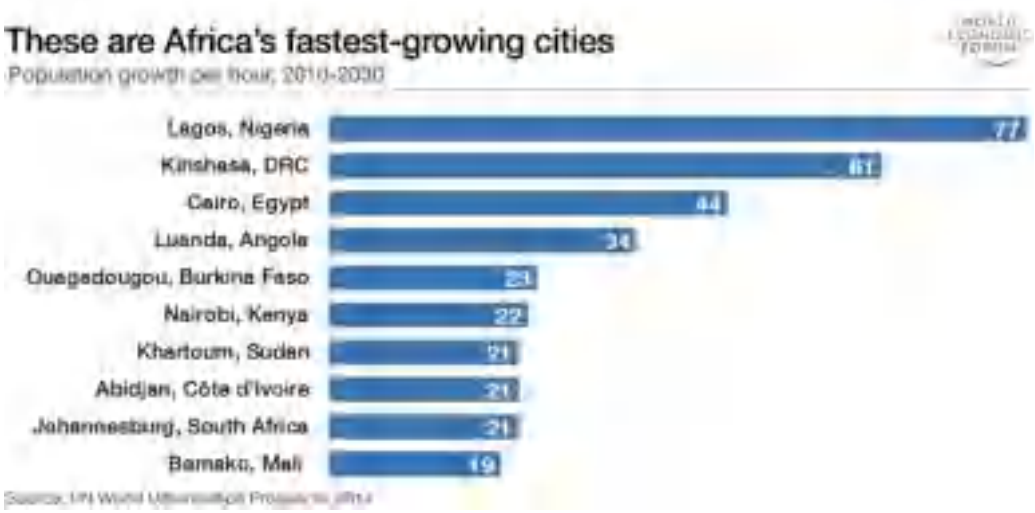

Figure 2: Population growth per hour in 10 fastest growing cities in Africa
Source: World Economic Forum

required to find effective ways to drive the imperatives of inclusive cities within its development agenda (Simbanegavi, 2019).

There is a need for cities to develop infrastructure to accommodate the kind of population illustrated in Figure 2 above (World Economic Forum, 2020). The problem is that traditional funding mechanisms fall short of this current demand for infrastructure projects in our cities. As the global economy slows down, South Africa revises its public expenditure as tax revenues are negatively impacted. The deteriorating financial position of state-owned companies has put additional pressure on the public finances; weak economic performance and residual problems in tax administration have resulted in large revenue shortfalls (SA National Treasury, 2019; 2020; 2021).

With all of these challenges, SA National Treasury has been applying significant budget cuts to several government departments. The budget cuts have an impact on the quality and capacity of infrastructure. Given the current significant budget cuts by the government, funding for infrastructure such as roads, schools, clinics, libraries, and many more is compromised and in some instances non-existent in South Africa. As part of the 2019/20/21/22 budget priorities, SA government resolved to renew economic growth by

strengthening private-sector investment, improving the planning and implementation of infrastructure projects, and rebuilding state institutions, however government remains under pressure on funding infrastructure projects required for developmental purposes (SA National Treasury, 2019).

South Africa experiences fiscal constraints as a major hindrance to delivering infrastructure projects. There is need for other forms of funding different from the traditional sources such as Land Value Capture (LVC). By definition, LVC is a mechanism used to secure societal benefits from increases in land value that can arise from changes to land use rights through the planning system and investments in public infrastructure (McAllister, 2018). In essence, municipalities use innovative approaches to creatively capture the value that arises from the improvements to the land. The agency responsible for the development of the infrastructure captures part of the financial benefits gained by land developers or the community at large. This benefit is reflected in an increase in the real property values, which can be regarded as a comprehensive index of all the benefits generated by the development, including improved accessibility and an increase in business opportunities. However, the implementation of LVC is not clearly conceptualised in the case of South Africa to guide its implementation (McGaffin, 2013). This delays the much-needed developments in our growing cities.

McGaffin (2013) stated that the key LVC tools currently used in South Africa are development charges and business improvement districts; however, there is also an increasing desire to use Tax Increment Financing (TIF) to fund some infrastructure projects in the future. TIF is also used to redevelop deteriorated neighbourhoods (Squires and Hutchison, 2014). Although in many cases it is greatly underutilised, development charges are the main income-generating value capture instrument used in South Africa (Savage 2009). According to McGaffin (2013), even though some value capture mechanisms are being used in South Africa, the legal framework is at times unclear and inconsistent. As a result of this lack of clarity, the use of value capture in the country is limited.

Using the underpinnings of planning gain and investment theories, **t**he paper aims to propose a guideline through which LVC can be effectively used to fund infrastructure projects given budget constraints currently experienced in South Africa. Concepts include risk associated with legislation and governance, value creation and capture. Collaborative Private-Public-Partnership investment risk and return sharing cost recovery. The paper goes on to explain what challenges deter LVC optimisation and ends by recommending a guideline that optimises the use of LVC mechanisms within PPP in the context of South Africa.

2.0. Infrastructure Investment

Contributor to Economic Growth

Globally infrastructure development is known as a key factor for economic growth, poverty and inequality reducer (McGaffin et al. 2019). Infrastructure development serves a critical role in nation-building and economic stability, development and sustainability (Scientific Council for Government Policy, 2008). Van der Waldt (2018) concedes to the idea that infrastructure development plays a significant role in economic development, and the rapid urbanisation of sub-Saharan African cities places pressure on cities to provide sufficient infrastructure and services to their population. Infrastructure plays an important role in societal values and general economic improvement. Vukeya (2015) states that for significant economic growth of emerging economies, infrastructure investment equivalent to 25% of GDP is required yet infrastructure investment is way lower than that in SA.

Traditional method of funding Infrastructure Investment

According to McGaffin (2019), Even though there has been an increase in Private-Public sector partnerships and private sector investment in infrastructure, the government remains the primary supplier of economic and social infrastructure in most economies. In an attempt to forge economic growth, SA government has in recent years set up various economic and social infrastructure investment programmes (Vukeya, 2015). Literature reveals that the main challenges of all these programmes are the funding that negatively impacts infrastructure development in SA. Gong et al. (2021) emphasize that conventional revenue resources seem inadequate to respond to the increasing need to provide infrastructure in different economies, Gong et al. (2021) findings reinforce the importance of having alternative funding models such as LVC.

Status of SA Infrastructure Investment

According to the South African Cities Network (2011, 2015, 2016), the sphere of government largely responsible for social & economic infrastructure development is municipalities (local government). Municipalities are funded from the collection of their revenues, and the national government transfers these based on the Division of Revenue Act 2 of 2013. However, the ability of the national government to fund municipalities through national transfer is constrained by the decline in economic growth and the government's reduced tax revenue collection (McGaffin, 2019; Vukeya, 2015). The funding constraints places pressure on municipalities to do trade-offs between infrastructure investment for economic

development and re-dressing of historical development imbalances (McGaffin et al. 2019).

The main aim of the study is to is to contextualize ways in which LVC can be effectively used by SA local government to fund infrastructure projects given economic declines and budget constraints experienced by thee South African government. The paper's contribution is that it provides guidelines suitable for the effective implementation in the context of South Africa.

3.0. Theoretical Underpinnings; Understanding Land Value Capture

Planning Gain Theory

Land Value Capture was first introduced into literature around the 1970s, one of the publishers was the Journal of the American Institute of Planners which published a journal titled '*Suburban Land Appreciation and Public Policy.'* According to Allan Schmid (1970) the land market value in the USA doubled between 1956 and 1966, the total value moved from 269 billion US dollars to 523 billion US dollars over the period of 10 years. The increase in land value was not related to an increase in general price level but changes to land use rights.

Through the Planning Gain Theory, private developers cannot recoup sufficient returns on their investment unless they upgrade public roads and water supplies to service surrounding areas as well as their own development (Higgins, 2019). Planning gain theory postulates that there is an increase in land value resulting from land rights granted for that land accruing to the land owner. Higgins (2019) found an uplift in value for properties due to transport infrastructure upgrading in the UK. This concept is similar to Tax Increment Financing (TIF) by which approved development companies use the concept of 'value capture' to redevelop deteriorated neighbourhoods (Squires and Hutchison, 2014).

Value Creation

Gong et al. (2021) state that value created can be determined by linking land value increment with initial investments, and the difference is the capital gains derived from public improvements. Infrastructure gives the most perceptible and tangible benefits to its users, it can be translated as value created. There is a directly proportional relationship between land value and type of infrastructure. Value creation happens every time an action whose benefits exceed the costs is taken (Slegtenhorst, 2013). According to Ontario (2010) value is an individual's perception of the production and the appetite to pay for the gains that come with

the product. For instance, railway infrastructure projects can benefit the local citizens as there will be easy access to public transport. The land value of the homes in that particular area will increase because it is more attractive due to the accessible means of public transport.

Land Value Capture Instruments

These are the instruments used to claim a share in the resultant increase in value of land and property directly or indirectly (Offermans and Van de Velde, 2004). Countries such as Australia and the UK have used LVC mechanisms successfully to develop their cities. The idea is that the funds claimed back can be used to fund more projects and stimulate developments where the markets are deemed viable to make PPPs profitable. This develops communities further by providing the much-needed infrastructure for basic services provision. Some of the LVC mechanisms highlighted in the literature include developer contributions, betterment levies/tax, property rates and major beneficiaries' contributions.

Developer contributions is an LVC tool mainly used by local government where a developer pays a once-off charge as a condition of development permission or rezoning. Payments from the market are usually designed to recoup cost of infrastructure (roads, sewer lines) related to the development. Betterment levy or property rates are recurrent payments by landowners regardless of new development status charged by local government. The recurring payments charged are highly dependent on the nature of land or property value. Thus property rates are area and value based. Good examples come from Medda (2012) explaining the 'major beneficiary' contribution tool. Here, the contribution is negotiated between the developer (government) and those parties that benefit significantly from a project. A good example includes Cross rail in London where major contributions came from Canary Wharf Group, Heathrow Airport, and Bekerly Homes (Medda, 2012). Heathrow Airport saw value through better access to the airport by passengers, Wharf group & Bekerly homes benefited through properties increase as the mode of transport in the neighbourhood has been improved.

Tax Increment Financing mechanism has been popular in the United States of America. Through agents, municipalities estimate revenue/value increases from LVC projects and use that value to issue bonds for private sector investments. The UK and Australia still use LVC tools successfully. As Medda (2012) pointed there exists a development of regulations following LVC concept in the UK. The Garden City at Letchworth (1903), and the Milton Keynes Development Corporation (1967) where land value arising from residential development were reinvested in local infrastructure developments. UK has enacted several legislative attempts to harness betterment levies which included the Town and Country Planning Act

1947, the Land Commission Act 1967, the Community Land Act 1975 and the Development Land Tax Act 1976. In more recent years, Section 106 and the Community Infrastructure Levy (CIL) have been the primary mechanism through which governments have sought to capture development value in the UK.

In Australia, local and state governments use developer contributions in specific areas where developers are required to support the provision of public infrastructure servicing the newly developed precincts. In its infrastructure plans, Australia has made reference to utilising LVC mechanisms as a sustainable funding framework (Commonwealth of Australia, 2016). New South Wales is developing a value-sharing framework to help guide the use of Value Capture Mechanism for state government projects, Victoria has also developed a comprehensive value creation strategy for its infrastructure program.

Historically, Australian government has always provided grants for infrastructure projects to states and territories as the owners of the infrastructure assets, generally without attaching conditions or requirements as to attracting funding from other sources. In recent years, the government has considered a range of alternative funding and financing mechanisms, a notable example is the Gold Coast Light Rail Stage 1 project (Commonwealth of Australia, 2016). It is apparent that this funding mechanism is working effectively for the Australian Government, in choosing the approach government needs to understand the status of their society, economic status, political dynamics and many more.

4.0 Challenges to Land Value Capture

More tax burden

The property industry in Australia has shown discomfort with the value capture concept in the beginning, they argued that it was just another tax burden on developers and end users (Commonwealth of Australia, 2016). Gong et al. 2021 concede to the idea that stakeholders might view LVC as a more tax burden, hence it is critical to have a stakeholder engagement as a prerequisite to ensure support from stakeholders, objective and interests need to be clearly defined (Gong et al. 2021). A good example of a failed LVC project due to the aforementioned issues is a South African E-toll project that was initiated to improve Gauteng road infrastructure with an intention to recoup back the money through motorists paying a tariff. Motorists rejected to pay tariffs and argued that it was just another tax burden over and above existing taxes. This is because beneficiaries want to see the correlation between benefits and payments, for LVC to gain support there needs to be visible value created by that

particular project.

Identifying the beneficiaries of the LVC project

According to the Commonwealth of Australia (2016), developing a value capture strategy becomes challenging in identifying and measuring those who will actually benefit from the project being delivered. The identification of relevant beneficiaries is very critical in implementing the LVC project. This is because you do not want to claim value from the wrong beneficiaries, at the same time you don't want to exclude relevant beneficiaries. For effective capturing, there has to be a separation between direct and indirect beneficiaries, clear comprehension of different beneficiaries groups as result of that specific public action (Commonwealth of Australia, 2016)

Clear correlation between benefits and payment

The public wants to see the correlation between benefits and payments, for Land Value Capture to gain support there needs to be clear value created by that particular project. In South Africa the E-toll project is a good example, the lack of adequate engagement and education to the motorists resulted in the failure of the project (Matsiliza, 2016). It is apparent that the E-toll project brought lots of benefits to Gauteng province motorists, however the failure to clearly prove the correlation between benefits and payment to the motorists contributed to its failure.

Political scoring

Another downside of using Land Value Capture is that other political organisations may use it for political expedience. This is possible through mobilising community to defy the plans by government and also not to cooperate. In South Africa it was witnessed when different unions' organisations and other political figures influencing Gauteng citizens in not paying for their E-toll bills. When implementing a Land Value Capture project, it will be vital to involve all political and civil organisations to prevent this from taking place.

5.0. Land Value Capture Legal Factors in South Africa

McGaffin et al. 2013 & 2019, Medda, 2012 concluded that SA legislation allows the use of LVC by government however municipalities do not have a written policy framework guiding LVC implementation. LVC is most successful when legal framework and administrative systems are well contextualised (McGaffin 2013). Lack of awareness and contextualisation of

LVC in SA seem to be the biggest contributor to its failure and unsuccessful use. Section 229 (1) of the constitution of the Republic of South Africa states that local government (municipalities) may impose taxes, levies and duties appropriate to local government if permitted by national legislation (RSA constitution 1996). As a result of Section 229, there have been three critical pieces of legislation that were developed to govern local government operations, these are Municipal Finance act 56 of 2003, Municipal Fiscal Powers and Functions Act 12 of 2007 and Municipal systems Act 32 of 2000. Land Value Capture can be implemented within the parameters of the aforementioned legislation in South Africa, however parameters are not clearly defined.

McGaffin et al. (2019), found that finance-ring fencing is essential in LVC, it ensures that the proceeds of value capture are used for the proper purpose. Ring fencing of income is usually viewed as problematic by authorities because it complicates their ability to set out budgets (McGaffin et al. 2019, Hickey-Tshangana, 2011). According to Hickey-Tshangana (2011), SA Treasury prohibits municipalities from income ring-fencing, this type of legislation stands as a hindrance towards the successful implementation of LVC.

6.0. Conceptual Framework: Guidelines Towards Better Implementation of LVC by Local Government

Literature shows a lack of understanding in South Africa regarding LVC. Thus using it as a source of funding infrastructure project is not clearly understood to encourage the much needed development (MacGaffin 2013, McGaffin et.al 2019, Medda 2012). Conceptually,

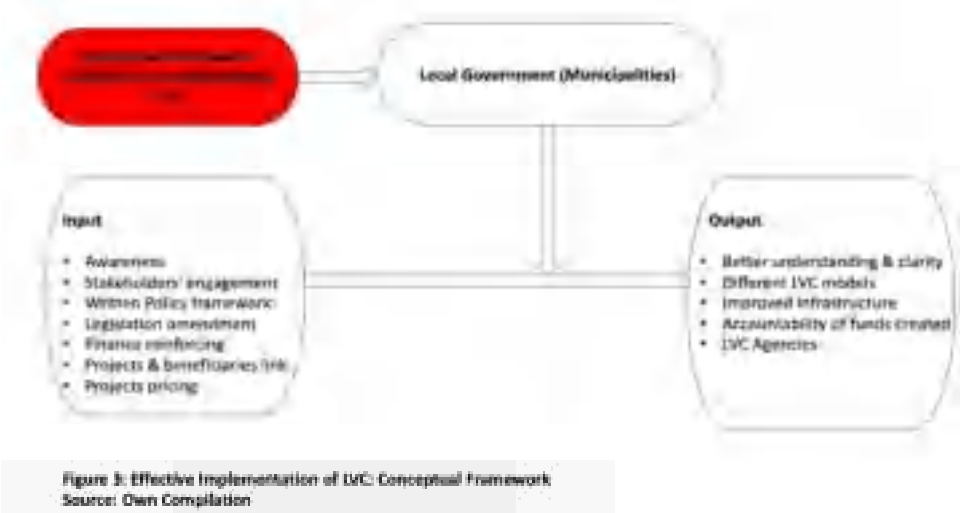

Figure 3: Effective Implementation of LVC: Conceptual Framework
Source: Own Compilation

there is need for a clearly explained guideline for LVC that can be used by local government where some of the LVC mechanisms as explained in literature can be utilised based on project specific. Based on theories from literature, the study has developed and recommended a conceptual framework as shown below i.e. Figure 3. The framework incorporates legislation, reducing the challenges associated with and how opportunities can be created to improve on the delivery of housing, clinics, schools, roads and many others (Figure 3) through Land Value capture model. LVC guidelines are able to raise awareness to policy makers and politicians especially local government for better implementation where the threatening challenges of LVC can be turned into opportunities.

Conceptual Land Value Capture Guidelines

1. Raise awareness to policymakers, property developers, council, government officials many others on infrastructure development funding through LVC.
2. Municipalities must develop a written policy framework to guide the implementation of LVC.
3. Treasury must amend legislation to allow finance ring fencing, LVC proceeds should be ring fenced to only be dedicated to infrastructure development.
4. The reconfiguration of various stakeholders is essential in the initial stage of every project.
5. Using PPP investments as a cost reduction strategy to fund city infrastructure developments.
6. Stimulate further spill-over effects by linking projects to beneficiaries (markets that pay) as it encourages improved land use planning and infrastructure investment
7. Affordable pricing helps reduce losses within the LVC investment framework bearing in mind that infrastructure developments provide public goods with free rider problems.
8. Establish internal municipalities LVC committees/ agencies/ structures.

7.0. Research Methodology: Document Analysis

According to Bowen (2009), document analysis is a systematic process of reviewing, evaluating & analysing documents in order to discover data that will assist in answering research questions. The primary research question of this study is 'What guidelines can make LVC effective as an alternative funding model for infrastructure development by South African Local Government?' In this study a systematic technique of analysing documents

using content analysis guided by Adu, (2020) method of analysing documents has been adopted to analyse five key selected documents listed below. The sampling process heavily relied on the conceptual framework where documents were randomly selected depending on their relevance to the conceptual LVC guidelines research questions.

Document 1 is the Johannesburg Development Agency (JDA) business plan 2020/2021. This document is readily available for the consumption of the public and the main purpose of the document is to outline the objectives, operation matters, future, and performance overview of the JDA. The document was produced by the executive management of the JDA under the leadership of the Chief Executive Officer (CEO) and approved by the mayoral member committee for the development planning of Johannesburg City.

Document 2 is the Municipal Fiscal Powers & Functions Act 12 of 2007 of the South African legislation. Its primary objective is to regulate the exercise by municipalities of their power to impose surcharges on fees for services provided under section 229(l) (a) of the Constitution; to provide for the authorization of taxes, levies, and duties that municipalities may impose under section 229(l) (b) of the Constitution; and to provide for matters connected therewith.

Document 3 & 4 is the Municipal Systems Act 32 of 2000 and Municipal Finance Management Act 56 of 2003 respectively of the South African legislature. Their primary objective is to prescribe and regulate the management of municipalities and its finances.

Document 5 is the City of Johannesburg Development Contributions 'Policy_Draft_June 2020' prepared by a consulting team for the City of Johannesburg. The purpose of this document is to simplify and integrate the process paying development contributions. The choice of all documents is informed by the conceptual framework discussed in literature review chapter and it's the relevance to the research questions, objectives and aim of the study.

Document Analysis Process

The document analysis begins with a thorough process of selecting key relevant documents; the choice of the documents is informed by the conceptual framework, research questions, aims and objectives of the study. Each document is analysed rigorously guided by the research questions; any significant information that seems to answer the research questions is coded under the relevant theme. The conceptual framework deduced in literature is re-visited and examined for better understanding, the conceptual guidelines towards successful implementation of LVC are used as the themes as shown in Table 1. The study used the

conceptual framework guidelines as themes and develop code frames from the information on the documents. The systematic technique process followed in this study is shown below in points form:

Step 1: Examining the conceptual framework

Step 2: Review all documents individually to gain proper understanding of context

Step 3: Start Coding process based on the significant information found on each document

Step 4: Compile all codes

Step 5: Arrange the codes alphabetically

Step 6: Count number of times a code appears (Tally codes)

Step 7: Sort the codes under their respective theme table

Step 8: Engage in critical thinking and free writing

8.0. Results & Discussion

Triangulation provides the confluence of evidence that breed credibility of the results, and reduces biasness of any of the data sets (Bowen 2009). In this study conceptual framework and the content analysis are triangulated to produce 'guidelines towards better implementation of LVC by SA municipalities. Conceptual guidelines towards the successful implementation of LVC explained in Figure 3 are used as a basis (themes) to analyse selected key documents collected from local government website and publishments. This section presents the findings of document analysis in relation to the research questions, purpose, and objectives of the paper thus the conceptual framework guidelines are used as themes and code frames are developed from the information on the documents. Firstly the key relevant findings are discussed in a theme-based form, meaning each theme is discussed in detail what it entails and sample extracts from the data, and through these themes, we are able to understand what the documents are saying about the current status of the

Table 1: Presentation of results from documents analysis. Source: Author

Themes	Usage (1)	Stakeholder Engagement (8)	Policy Framework (2)	Legislation (9)	Projects Implementation (8)
Codes	Awareness of LVC (1)	Successful Stake Engagement (2)	Unavailability of LVC policy framework (2)	Finance reinforcing permissible (1)	Fair Projects & Beneficiaries link (5)
Codes	Evidence of intentional use of LVC (0)	Unsuccessful-stakeholder engagement (2)	Available policy framework (0)	Finance reinforcing prohibited (0)	Effective Projects pricing (1)
Codes		Poor Working relationship between departments (4)		Permitting Legislation on LVC (8)	Poor Projects Planning & Management (2)
Codes		Good Working relationship between departments (0)		Prohibiting Legislation on LVC (0)	Ineffective project pricing (0)

implementation of the LVC by SA local government and the inconsistence between documents and conceptual framework. Lastly, the key findings and key takeaways are summarised in brief form.

Usage & Awareness

Content analysis on LVC usage indicates that there is very low usage of Land Value Capture by local governments in South Africa; in fact there is no relevant significant information from the reviewed documents which shows that there is any intentional use of LVC to fund future infrastructure developments. There is evidence from documents that local governments have knowledge of LVC, however, the knowledge is minimal. Further to the above-mentioned, the significant information found on the knowledge of the LVC does not directly speak to the Land Value Capture concept in detail.

Stakeholder Management

Conceptual framework highlighted stakeholder management as one of the key guidelines towards the successful implementation of LVC by local government. The emphasis is on the engagement between public office and beneficiaries. Document analysis shows an equal representation of both successful and failed stakeholder management. There is a high number of significant information indicating a poor working relationship between government departments. Moreover from the documents, there is no evidence suggesting that there is a good working relationship between government departments.

Policy Framework

The significant information found in documents suggests that there is no formal written policy framework on LVC currently by the SA local government. In addition, there is no information found suggesting the availability of a written policy framework on land value capture which corresponds with the finding of the literature.

Legislation

The significant information on legislation has the highest frequency in this analysis, documents suggest that SA legislation allows the implementation of LVC in its current form. Documents do not show any information suggesting prohibiting legislation on LVC however there is no direct mention of the concept in legislation which shows that the legislation is not clear and precise.

Project Implementation

Document analysis indicates a mix of findings on projects implementation, the 'fair projects & beneficiaries' link has a highest code frequency under this theme. This suggests that projects-beneficiaries link is implemented appropriately. However there is poor project planning and management as it is the second highest code frequency under this theme. 'Effective project pricing' is the third highest frequency then followed by ineffective projects pricing which has a zero frequency. This shows that there is no significant information on documents related to ineffective projects pricing.

9.0. Conclusion on LVC in South Africa

In South Africa, traditional methods of funding infrastructure development by the government is overwhelmed and there is an urgency in using alternative funding models such as Land Value Capture. Results show significant inconsistences on how LVC is currently being implemented according to the document analysis. This compares with the conceptual framework used in this study to appraise its use. The conclusion is that using LVC to deliver infrastructure is still haze and fragmented to guide its successful implementation by municipalities. There is a lot of work to be done to fit the ideal requirement of a successful LVC.

10. Recommendation

To ensure sustainable development of cities, the study recommends a framework that requires fiscal reform, legislation & policy clarification, finance reinforcing, stakeholder engagement, general awareness and urban infrastructure investment in the form of efficient PPPs. Urban capital investments are recovered through LVC instruments in the form of tax, inducements, and agreements between the municipalities, companies and the communities or the markets. Cities will benefit immensely in the revenue generation efforts. The framework requires that legislation reduces the challenges associated with LVC. Profitable opportunities are the cornerstone by which the private sector carries out investments for the delivery of housing, clinics, schools, roads, and many others. The market has to be able to afford the tariffs required to make the PPP model work.

11. Future Research

Future research should focus on expert advice on Land Value Capture to validate a conceptual model recommended from this study.

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CAUSAL BEHAVIOUR OF REIT DIVIDEND RETURN UNDER ASYMMETRIC MARKET INFORMATION: EVIDENCE FROM SA REIT MARKET

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Abstract

Purpose: With a focus on the South African REIT market, this study examined the behavioural pattern of REIT dividend returns and establishes a causal linkage between information asymmetry indicators and REIT dividend return behaviour.

Design/Methodology/Approach- The daily returns on twelve (12) quoted SA REIT firms, and daily data on market information asymmetry indicators such as ask-bid price, trade volume, number of shares listed, volatility index, weighted value average price and market capitalization from the year 2007-2017, extracted from IRESS Expert database were used. The average of the data was calculated and used as a proxy for market data such as market REIT dividend return, market spread, market turnover market volatility index, market value-weighted average price and market capitalization. The study conducted a unit root and co-integration test, while the vector error correction model (VECM) was deployed to analyze the causal behaviour of REIT dividend returns under the asymmetric market information.

Finding: For the reviewed period (2007-2017), SA market REIT has a negative average return (-0.0312), skewed negatively (-6.2136) and exhibited gentle fluctuations, with higher degrees recorded in trading days of 2013, attributed to a transition period of the SA property stock to REIT regime. Also, the SA REIT dividend return behaves in a similar manner and responds

sharply to shock in the market spread. Co-integration relationships exist among the exogenous variables, and market spread exhibited a significant causal effect (p<.05) with REIT dividend returns dynamics in both short and long-run relationships.

Practical implications: The study provides insight into the behaviour of REIT dividend return in an asymmetric information market condition of the South African property stock market.

Originality/Value: The study provides useful information on information asymmetry indicators that explains South Africa REIT dividend return behavior. Additionally, this is the first study to investigate REIT dividend returns behavior under the asymmetric market information using the South African REITs context

Keywords*: REIT, Dividend Return, Information Asymmetry, Causal Behaviour*

1.0. Introduction

Information on stock dynamics stimulates the reactions of market participants to trading activities such as choice of stock to buy, sell and hold, price, return on investment and volume of stock traded (Ajina, et al., 2015). By implication, information transparency and the levels of its free flow are essential not only to the market and stock performance but also critical to market analysts and fund managers for informed decision making. The dynamics of market information on stock are attributed to changes in the economy, policy, regulations, and underlying factors characterized by the stock industry and company-specific indexes. While information transparency is key to informed decision making in the stock market, Anim-Odame (2022) posited that the African real estate market is less transparent and yet to be fully matured. Whereas Sahin, et al. (2020) stressed that information on REIT announcements and RIET spread is essential for fund managers in the implementation of their investment policy.

The stock market is said to experience transparent trading activities when the market participants, the buyers and the sellers enjoy good access to and have a fair knowledge of the stock market information. In a case of an information mismatch, the stock trading activities are said to be carried out under information asymmetry, implying a knowledge gap between the sellers and the buyers or the informed and uninformed investors (Naqvi et al., 2021). The situation creates a frightening trading environment and distorts the stock market from attaining its equilibrium position. Asem, et al (2022) posited that more available information on dividend changes encourage institutional investors to trade more, and this has given REIT vehicle an edge due to their transparent nature. Whereas, evidence of information

asymmetry in the REIT market has been reported in the literature **(**Devos, et al. 2019; Feng, 2021), its causal effects vary from one local stock market to another. The difference is linked to the peculiar attributes of each local REIT market, considering their level of market maturity, therefore informing the need to evaluate the similar situations in the South African REIT market.

The choice of the South African REIT market cannot be disconnected from the leading role the REIT market plays in the continent REIT industry and global REIT market space (Ijasan, et al 2021). The SA REIT market remains the major active property stock market and has a market capitalization worth US$30 billion in 2018. Also, the SA REITs market is the only quoted African REIT market on the FTSE EPRA NAREIT global indexes. As of August 2020, SA REIT was ranked 21st position and contributes about 0.30% to the global REIT market index (Akinsomi, 2022). The statistics show the sophisticated nature and the enormous volume of stock traded by the local and international investors in the market. Therefore the need for investors to have useful information on REIT return behaviour in a fast-emerging REIT market in an asymmetry information market condition and the predictive causal factors is essential for informed investment decision making and serving as guidance for developing a sustainable strategic investment plan by investment analysts, fund managers, regulators and policymakers in the REIT industry.

2.0. Literature Review

Many factors are responsible for REIT return behaviour; such as volatility, asset growth, financial leverage, economic factors, investor sentiment and more (Dogan, et al., 2019; Letdin, et al., 2019; Nti, et al., 2021; Song & Zhan, 2022). For instance, Dogan, et al. (2019) investigate determinants of REIT capital structure in twelve (12) countries including South Africa. The authors reported that financial leverage plays a significant role in determining REIT payout power. Song & Zhan (2022) assess the interactions among REIT return, stock return and option price implied information behaviour. The study discovered that REITs are more transparent and price-efficient but less liquid than stocks. The authors posited that REIT return behaviour is strongly explained by changes in option implied volatilities. Meanwhile, in an attempt to explain REIT return behaviour, Letdin, et al., (2019) extensively review empirical relevant literature and concluded that predictive information on volatility, valuation, asset growth, financial leverage and investor sentiment are useful for investors for policy implementation

Another prominent factor that is generating academic research interest in literature is information asymmetry (Ajina, et al., 2015; Devos, et al. 2019; Sahin, et al., 2020; Feng, 2021). The increasing interest in appraising the causal linkage among REIT return, dynamics of market information announcement and its driven factors such as market spread, volatility, turnover, and REIT size (market cap.) among others, is attributable to their predictive power to explain how returns of REIT behave under the fast-changing pattern of information dissemination and diffusion, especially in the emerging REIT market (Nti, et ai., 2021). Therefore the debate on issues concerning information asymmetry in the stock market and by extension in the REIT industry will continue to receive research attention because of the level of adverse effects an information mismatch can have on the performance of the stock market which varies from one country to another, reason attributed to uniqueness characterized by local stock market across the globe.

From the parlance of the empirical literature on REIT markets, the trending debates on information asymmetry and REIT return dynamics are mixed, with varying results across the globe. For instance, Feng (2021) tries to answer whether information asymmetry affects REIT investment behaviour in the US stock market. The study assesses the information disclosure of REIT firms and found that while REIT firms characterized by high-information-asymmetry are less active, low-level information asymmetric REIT firms have higher growth of real estate investment. The author further ascertained that information asymmetry has a positive relationship with capital costs and is negatively related to operational performance. Whereas, a study by Devos, et al. (2019) attempts to know whether the transparent nature of REITs, which implies a low level of information asymmetry can be sustained when REIT stocks are exposed to the capital market. The study discovers that REITs increase their information disclosure when they assess the capital market, thereby lowering their level of information asymmetry. Also, the authors established interactions among REIT size, ask-bid spread and turnover. Similarly, Asem, et al. (2022) study tries to know whether institutional investors are well informed about the changes in REITs dividends. The authors reported that the investors are relatively more informed about the events by REITs than industrial firm, the reason attributed to its transparent nature. However, the findings are unique to the local REIT market, and thus cannot be generalized to other REIT markets.

Whereas, such study is a dearth in the African REIT market because of some challenges attributed to the level of maturity, transparency and data availability challenged characterized by developing economy in general and the emerging REIT market in particular (Anim-Odame, 2022). Notwithstanding, empirical evidence has shown a co-movement of the Africa REIT market with regional and global markets (Boako & Alagidede, 2017). Specifically, a

recent study conducted by Ijasan, et al. (2021) evidenced the integration of South Africa REIT (SA REIT) into the major global real estate market, which spans Europe, Asia and North America. The author reveals that, although the pattern of integration is unique, non-uniform, and largely depends on the local geographical attributes, generally, SA REIT exhibited diverse directional linkages with low levels of coherencies, indicating diversification gains. This suggests the global relevance of the SA REITs market, thereby necessitating the need to have useful information on the dynamics of REIT return behaviour and its associated causal linkages under asymmetric market information for informed decision making and policy implication.

3.0. Research Method

3.1 Data Description and Sources

The study used secondary data, extracted from IRESS Expert database from the year 2007 to 2017. A total of twelve (12) REIT firms having consistent data publication spans over the reviewed period were considered. The sample data were dividend yield and the information asymmetric market indicators namely ask-bid price, trade volume, No. of shares listed, volatility index, weighted value average price and market capitalization of SA REIT market. The average value of the variables was estimated and used as a proxy for REIT market data such as market REIT dividend return (MRDR), market spread (MSPD), market turnover (MTNV), the market volatility index (MVIX), the market value-weighted average price (MWAP) and market capitalization (MCAP). Meanwhile, some variables such as volatility index, weighted value average price and market capitalization were extracted directly and estimated (average) for market data. Other variables such as dividend return, bid-ask spread, and turnover ratio were derived data. The mathematical equations of the dividend return (*Eqn.1*), bid-ask spread (*Eqn.2*) and the turnover (*Eqn. 3*) are expressed as thus:

$$Dividend\ Return\ (DR) = \left(\frac{DY_t - DY_0}{DY_0}\right) * 100 \text{ ----------Eqn. 1}$$

Where $\boldsymbol{DY_t}$ is the REIT dividend yield of the current trading day (***t***) and the $\boldsymbol{DY_0}$ is the REIT dividend yield of the previous trading day. The dividend return was calculated for all the REIT stocks considered, and the average for the REIT stock was estimated and used as a proxy for market REIT dividend return (MRDR).

$$Spread = \frac{Bid - Ask}{\left[{}^{(Bid+Ask)}/_{2}\right]} \text{ ----------Eqn. 2}$$

The ***Bid*** is the open price and the ***Ask*** is the close price of the trading day for the reviewed period (2007-2017). The estimated average spread is calculated and used as a proxy for the daily market spread (MSPD). The higher the spread value, the higher the market information asymmetry.

$$Turnover = \frac{Volume}{No.of\ Shares} \qquad \text{----------Eqn. 3}$$

The *volume* connotes a total number of daily REIT shares traded (bought and sold), while *No. of shares refers* to REIT shares that have been issued to investors or are available for purchase. Turnover rate primarily measures liquidity, the higher the turnover, the more liquid the REIT stock. The REITs market data and their corresponding acronym is presented in Table 1.

Table 1: REIT Stocks and Acronym

REIT Market Data	Acronym
Market REIT Dividend Yield	MRDR
Market Spread	MSPD
Market Turnover	MTNV
Market Volatility Index	MVIX
Market Value Weighted Average Price	MWAP
Market Capitalization	MCAP

3.2 Descriptive Statistics

The study used descriptive statistical tools such as mean, standard deviation and skewness to analyse the market REIT data. The *mean statistics* give the average estimate, *standard deviation* measures the risk level and *skewness* indicates the lop-sidedness of the series data over the reviewed period. In addition to this, the data series was transformed into a log form and used for time series graph analysis. The transformation to log form helps to stabilise variance in the series and reduces data variability.

3.3 Test for Unit Root and Optimal Lag Length

The quality of the causality model and the reliability of its predictive power is hinged on whether the time series data is stationary or not. When time-series data is non-stationary, it signals the presence of unit root and is not good for causality models. Therefore good time-series data for causality models must be stationary in the absence of a unit root. Thus, to ascertain the status of the data, the study conducted two different unit root tests, *Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP)* tests. The two tests were conducted to ascertain the unit root attribute of the data, using *the Schwarz information criterion (SIC)* and *Trend and Intercept* criteria for the model specification. Also, to enhance the reliability of the causality

model, the study conducted a *VAR Lag Order Selection Criteria* for choosing the appropriate lag length order (optimal lag) given the size of the time-series data

3.4 Co-integration Test

Co-integration test helps to establish relationship dynamics among the exogenous variables and the appropriate model to use in a causality analysis. In a VAR environment, when there is a case(s) of co-integration among the exogenous variables (long-run relationship), the appropriate model to use is Vector Error Correction Model (VECM). In other case(s) of no co-integration, a Basic VAR model is deployed. However, the study used the Johansen Co-integration test which comprises *Trace and Maximum Eigenvalue Rank* Tests. The two test results complement each other to ascertain the dynamics of the relationship among the exogenous variables. The mathematical equations for Johannes Co-integration's Trace *(Eqn. 4)* and the Maximum Eigenvalue *(Eqn. 5)* rank tests in a VAR environment are expressed as follows:

Trace Rank Test (LR_{tr})

$$LR_{tr}(r/k) = -T \sum_{i=r+1}^{k} log\,(1-\delta_i) \quad \text{---------- } Eqn.\ 4$$

Where ***r*** is the null hypothesis of *Trace Statistics* and shows no co-integrating relations against the alternative of ***k***. $\boldsymbol{\delta_i}$ is the ***i-th*** largest eigenvalue of the analysis.

Maximum Eigenvalue Rank Test (LR*max*)

$$LR_{max}(r/r+k) = -T\,Log(1-\delta_{r+1}) = LR_{tr}(r/k) - LR_{tr}(r+1/k) \text{ .Eqn. .5}$$

Where the null hypothesis of ***r*** shows no co-integrating relations against the alternative of ***r+1*** However, the null hypothesis (***r***) of no co-integrating relations is rejected in favour of the alternative relations (***k)*** if the p-value is less than 5% level of confidence (p<0.05)

3.5 Vector Error Correction Model (VECM) Granger Causality

When there is evidence of a co-integration relationship among exogenous variables, which indicates a long-run relationship, the appropriate causality model to use is the Vector Error Correction Model (VECM). The VECM is a restricted VAR model with co-integration restrictions built into the specification. The model performs two major functions. First, it examines the long- and short-run dynamics of the co-integrated series and second, it restricts the long-run behaviour of endogenous variables to converge to their co-integration

relationships refers to short-run structural adjustment (Leonard, Humayun, Haiyue & Yunjie 2020). However, the cointegrating term is known as Error Correction Term (ECT). In a good causality model, the ECT is expected to be negative and has a statistically significant p-value ($p<0.05$) in a short run structural adjustment model. Conventional VECM in a VAR is expressed as in Eqn. 6

$$\Delta Y_t = \sigma + \sum_{i=1}^{k-1} \gamma_i \Delta Y_{t-i} + \sum_{j=1}^{k-1} \pi_j \Delta X_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta R_{t-m} + ECT_{t-1} + \mu_t \quad \text{-----Eqn. 6}$$

Where the explained (dependent) variable ($\Delta \boldsymbol{Y_t}$) is the market RIET dividend return (MRDR). The changes in the MRDR in the model are explained by the changes in the exogenous (independent) variables (Y, X, R). In this study, the exogenous variables are the market spread (MSPD), market turnover, (MTNV), the market volatility index (MVIX), the market value-weighted average price (MWAP) and market capitalization (MCAP). The short-run dynamic of the model's adjustment to co-integrating relations (long-run equilibrium) is measured by γ_i, π_j and θ_m for the corresponding exogenous variable (Y, X, R). The model is differenced at I(1), therefore the lag length is reduced by one ($k-1$) across the model, and also at optimal lag ($t-i, t-j, t-m$) of the regressor. ECT_{t-1} is the error correction term lag (residue from dependent variable) at I(1) and contains long-run information derived from the long-run co-integration relationships. μ_t is the stochastic error term referred to as impulse and measures the response of the dependent variable (MRDR) to shock from the regressor. Thus, the VECM equation can be re-write to reflect the terminologies of the study as in Eqn 7:

$$\Delta \mathrm{MRDR}_t = \sigma + \sum_{i=1}^{k-1} \gamma_i \Delta \mathrm{MRDR}_{t-i} + \sum_{j=1}^{k-1} \pi_j \Delta \mathrm{MSPD}_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta \mathrm{MTNV}_{t-m} +$$

$$\sum_{n=1}^{k-1} \rho_n \Delta \mathrm{MVIX}_{t-n} + \sum_{r=1}^{k-1} \omega_r \Delta \mathrm{MWAP}_{t-r} + \sum_{u=1}^{k-1} \phi_u \Delta \mathrm{MCAP}_{t-u} + ECT_{t-1} + \mu_t \quad \text{---Eqn. 7}$$

Limitation to the findings of the study

The period covered by the study (2007 to 2017) is a limitation as it indicates a 5-year gap (2018 to present). While it is accepted that a more recent data set would have been more insightful, nevertheless, the 5-year gap may not have significantly influenced the findings. Perhaps, this may form the subject of another study.

4.0. Result and Discussion

Descriptive Statistics

In Table 2, the SA REIT market return is negative (-0.0312), characterized by risk level (3.9958), and negatively skewed (-6.21136). The result implies that the dividend return of the REIT market declines over the reviewed period. The observed negative skewness signals the asymmetric (non-normal) distribution pattern, meaning that the mean dividend payout is less than the median return. The result aligns with the findings of Ijasan, et al.(2021) study. The study had analyzed the performance of global REIT market return including the SA REIT market, from 2013 to 2018. The authors reported a negative mean and skewness for the SA REIT market over the study period.

The market bid-ask spread has a negative mean and skewness value of -0.2039 and -9.6053 respectively. The result reflects the depth and wide of bid-ask spread in the SA REIT market, indicating the presence of information asymmetry. This suggests that more investors prefer a limit to the market price. This is because the majority of the investors buy at a price above the limit order price (Ask>Bid price). The result is attributed to the liquidity preference of the REIT stock and investor confidence in the REIT market. Moreover, other information asymmetry market indicators such as turnover, volatility, weighted average price and REIT size (market cap.) have their respective mean value higher than the median value (mean>skew), indicating that the larger value recorded for the indicators exceeded their median value.

Table 2: Descriptive Market Analysis

Variables	Mean	Std. Dev.	Skew	Min.	Max	No. of Obv.
MRDR	-0.0312	3.9958	-6.2136	-79.0640	55.4791	2749
MSPD	-0.2039	1.5343	-9.6053	-18.9238	3.2143	2749
MTNV	21.4628	35.9712	11.9613	0.0178	951.593	2749
MVIX	28.7216	5.4407	0.3208	19.2609	42.2227	2749
MWAP	2619.214	645.90	0.0944	1135.81	3757.42	2749
MMCP	1.40E+10	6.05E+09	0.5686	5.86E+09	2.51E+10	2749

Trend Analysis

The graphical illustrations in Fig 1-5 present the trend (in log form) of the REIT market indexes over the study period (2007-2017). The SA REIT market return (in Fig 1-5) experienced gentle fluctuations over the period under review, but with a sharp downward-swing movement in the trading days of the year 2013, attributed to spell-over effects of the REIT transition

regime. Whereas more frequent fluctuations were observed in the trends of the market bid-ask spread (MSPD) and the market volatility index (MTNV) as shown in Fig. 1&2 respectively. The widening spread and fluctuated turnover signal the challenges of information asymmetry in the market, attributed to relatively less liquidity, transparency and maturity characterized by the emerging REIT market (Anim-Odame, 2022). Whereas in Fig. 3, the trend in market volatility (MVIX) exhibits a 'zig-zag' gentle slope pattern. For instance, the MVIX reached its peak in 2012, thereafter; the trend has been consistently falling, with a sharp fall noted in 2013 and 2016-2017. This further suggests that the SA market volatility is gradually bouncing back to a stable condition. The graphic illustration in Fig. 5 explains the trend in the REIT market size (market capitalization).

The market size witness a contraction from 2007 to early 2009, thereafter entering into a recovery state in late 2009. By late 2009, the market enters into an expansion phase up to the year 2015, after which it remains flat. A similar trend pattern was obtained in the average price movement in Fig 4. The average price initially saw a downward trend from the beginning (2007) to late 2009, thereafter proceeded in upwards movement from 2010 to 2015, and remain flat to 2017. The steady expansion of the REIT market size demonstrated the unprecedented growth of the market as reported by Akinsomi (2022) and further ascertained the prediction by Boshoff & Bredell (2013) on the growth potential of the SA REIT market for global relevance.

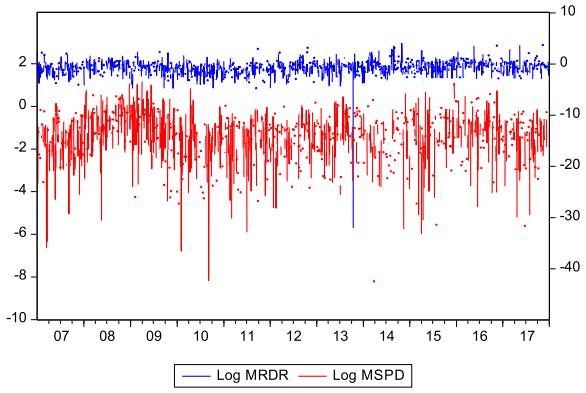

Fig. 1: Trend in MRDR and MSPD

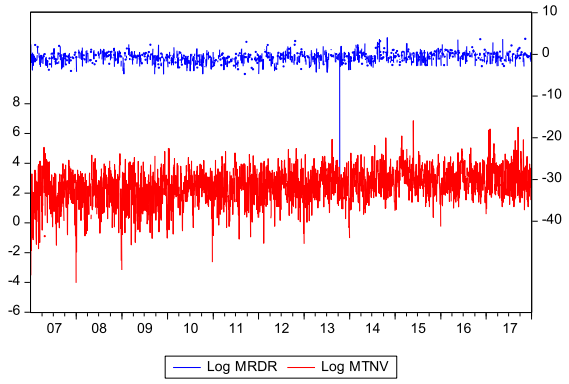

Fig. 2: Trend in MRDR and MTNV

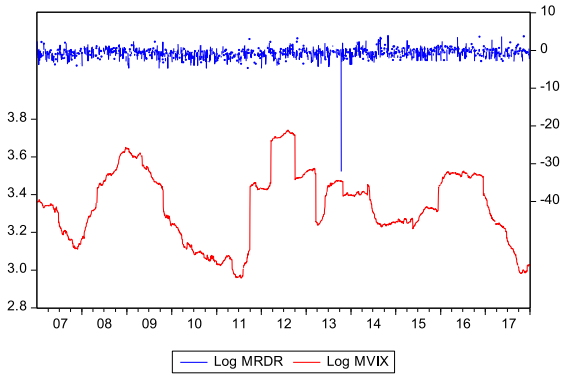

Fig. 3: Trend in MRDR and MV_{IX}

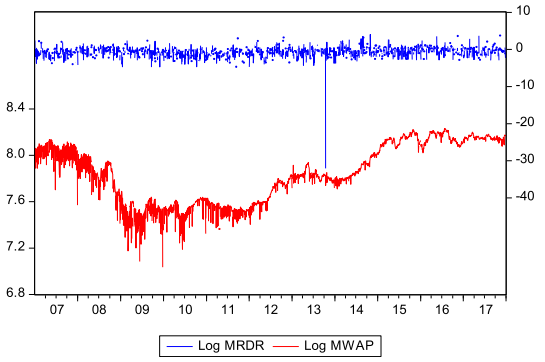

Fig. 4: Trend in MRDR and MWAP

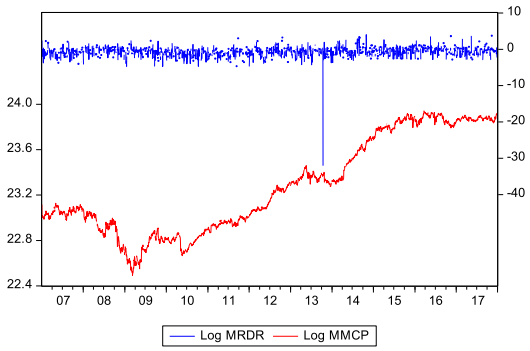

Fig. 5: Trend in MRDR and MMCP

The illustration in Fig. 6 explains the behaviuor of the REIT market dividend returns to response to shock in information asymmetry indicators. Using Cholesky One Standard Deviation (S.D.) innovations statistics, the REIT dividend return (MRDR) behaves similarly and response sharply to shock in the market spread (MSPD). The co-movement in similar manner implies that changes in the behavior of the SA REIT dividend return are driven by market spread dynamics. Meanwhile previous studies have reported the strong influence of bid-ask spread to explain REIT behaviour in other market. The findings of Feng, (2021) and Devos, et. al., (2019) in United States and United Kingdom REIT markets respectively evidenced the significant effect of bid-ask spread on REIT dividend return and concluded that wide spread signal high level of information asymmetry characterized with the REIT market.

Meanwhile, the response of the REIT dividend return to shock of other information asymmetry indicators such as market turnover (MTNV), the market volatility index (MVIX), market average price (MWAP) movement and market size (MMCP) were low and flat. The result implies that the influence of the indicators to explain the REIT dividend return is weak, therefore having little or no effects on the REIT market dynamics.

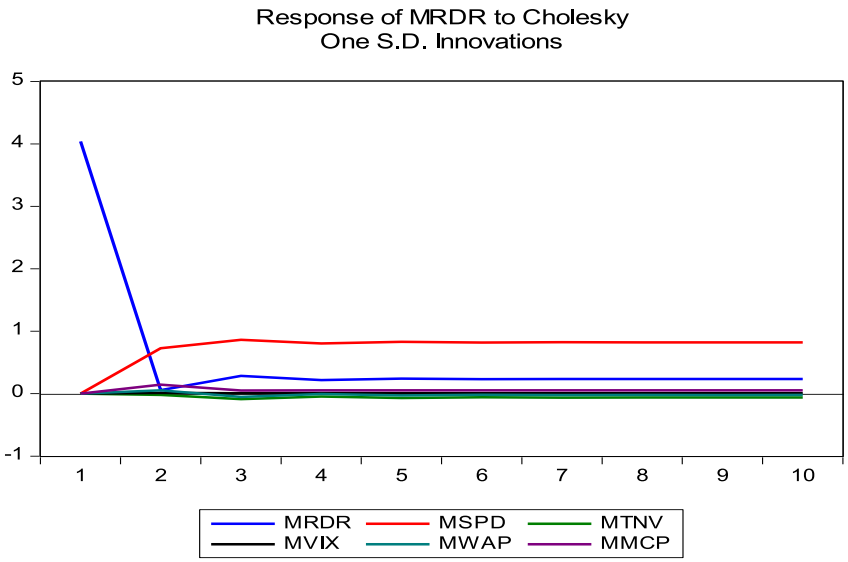

Fig. 6: Response of MEDR to information asymmetry market indicators

Data Screening and Lag Length Selection Criteria

To conduct causal analysis in a VAR environment, the need to know the stationary status of time series data and the appropriate (optimum) lag length to apply is critical to the predictive ability of the model. The result of unit root tests conducted is presented in Table 3. At level order precision (I(0)), the result of the ADF test shows that except for MSPD and MTNX data with statistical significant p-value ($p<.05$) and stationary, other data series namely MRDR, MVIX, MWAP and MMCP were less statistical significant p-value ($p>.05$) which mean the presence of unit root. For the PP test at (I(0)), MWAP data was found stationary ($p<.05$) in addition to MSPD and MTNV, while MRDR, MVIX and MMCP remain non-stationary ($p>.05$). Whereas, at first difference lag order precision (I(1)), all the data series were stationary ($p<.05$) for ADF and PP tests. The result is in tandem with previous studies (Huerta-Sanchez, et al., 2021; Saengchote & Charoenpanich, 2021; Olanrele, et al., 2021) that have reported the ability of economic data to attain stationary at first difference lag order (I(1)).

Table 3: Unit Root Test

Time Series Data	Augmented Dickey-Fuller (ADF)				Phillips-Perron (PP)			
	I(0)		I(1)		I(0)		I(1)	
	t-stat	p-value	t-stat	p-value	t-stat	p-value	t-stat	p-value
MRDR	-2.4143	0.3719	-56.4943	0.0000*	-2.2288	0.4727	-56.6283	0.0000*
MSPD	-26.6592	0.0000*	-18.3856	0.0000*	-49.3189	0.0000*	-740.059	0.0001*
MTNV	-21.83792	0.0000*	-19.8869	0.0000*	-50.4927	0.0000*	-898.242	0.0001*
MVIX	-1.512939	0.8253	-45.0719	0.0000*	-1.7756	0.7165	-46.1338	0.0000*
MWAP	-2.078092	0.5573	-25.5803	0.0000*	-3.9149	0.0116*	-210.109	0.0001*
MMCP	-2.3623	0.3994	-29.7529	0.0000*	-2.3242	0.4200	-52.1571	0.0000*

**Significant @5% level of confidence; Specification: Trend and Intercept*

To further enhance the quality and reliability of the model predictive power, the study conducted a lag order selection criteria test (see *Table 4*), aimed at selecting optimum lag for the time data series, giving attention to the size and peculiarity of the dataset. The study used the *Schwarz information criterion (SC)* at optimum lag 2 (72.76892*). The choice of *Schwarz information criterion (SC)* was informed by the work of Asghar & Abid (2007). The author claimed that SIC is characterized by the least probability of under or overestimation and relatively performs better, especially for a small sample size.

Table 4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SIC	HQ
0	-119877.4	NA	5.97e+30	87.89108	87.90409	87.89578
1	-99320.56	41008.26	1.75e+24	72.84645	72.93746	72.87935
2	-98948.26	741.0426	1.36e+24	72.59990	72.76892*	72.66099
3	-98813.98	266.6949	1.27e+24	72.52784	72.77487	72.61713
4	-98711.89	202.3046	1.21e+24	72.47939	72.80443	72.59687*
5	-98653.33	115.8030	1.19e+24	72.46285	72.86589	72.60853
6	-98602.42	100.4243	1.18e+24*	72.45192*	72.93298	72.62580
7	-98579.57	44.98625	1.19e+24	72.46156	73.02062	72.66363
8	-98542.01	73.77856*	1.19e+24	72.46041	73.09749	72.69068

LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion

The findings in Table 5 presents the dynamic relationships among the exogenous variables, namely the REIT market dividend return and asymmetric market information indicators such as bid-ask spread, turnover, volatility, average price movement and market size in an asymmetric market situation. This was done to know whether the dynamics of the causal behaviours, whether theirs is a long-run effect or the relationships fade away in the short run. The results of the co-integration tests show the evidence of both the short and long term relationships but not for all the six (6) cases examined. For instance, the null hypothesis of no co-integration relations was rejected (p<.05) for *'None', 'At most 1'* and *'At most 2'* cases for

both the *Trace Rank and Maximum Eigenvalue Rank* Tests, which implies the presence of co-integration relation. While the null hypothesis of no co-integration was accepted for cases for *'At most 3', 'At most 4'* and *'At most 5'* because of their statistical non-significant p-value (p>.05). This result signal the presence of long and short run relationship dynamics among the variables.

Table 5: Co-integration Test

Hypothesized	Trace Rank Test			Maximum Eigenvalue Rank Test		
No. of CE(s)	Eigenvalue	Trace-Stats	Prob.	Eigenvalue	Max-Eigen Stats	Prob.
None	0.251890	2118.373	0.0000*	0.251890	794.5813	0.0001*
At most 1	0.214290	1323.791	0.0000*	0.214290	660.3180	0.0001*
At most 2	0.207400	663.4735	0.0001*	0.207400	636.4110	0.0001*
At most 3	0.008831	27.06248	0.1001	0.008831	24.28740	0.0174
At most 4	0.000981	2.775080	0.9761	0.000981	2.687573	0.9654
At most 5	3.20E-05	0.087507	0.7674	3.20E-05	0.087507	0.7674

*Unrestricted Cointegration Test , Trace test indicates 3 cointegrating eqn(s) at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values, Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level.*

Meanwhile, when co-integration relations are reported in some cases (but not all) in a CE model, Leonard, Humayun, Haiyue and Yunjie (2020) argued that the appropriate causal model to measure the relationship dynamics is the vector error correction model (VECM). This informed the use of VECM to analyse the causal linkage of REIT dividend returns with the asymmetric market indicators such as market spread (MSPD), market turnover (MTNV), and the market volatility index (MVIX), the market-weighted average price (MWAP) and market capitalization (MMCP). The relationship dynamics is presented in Table 6. REIT behaviour is explained by two major factors under asymmetric market information conditions. First, by itself (MRDR t-stat: -2.1685; p<.05) and second, by market spread (MSPD; t-stat: -6.7886; p<.05). The explanatory power of other market indexes with correspondent t-stat., such as MTNV (1.3669), MVIX (0.1969), MWAP (0.9696) and MMCP (1.8612) is less statistical significant to explain REIT dividend behaviour in the long run.

Similarly, in the short run, except for MRDR (-2.16624) and MSPD (-6.78442) that exhibited statistical significant causal effects (p<.05), the study observed less significant (p>.05) predictive power of MTNV (1.3659), MVIX (0.1957), MWAP (0.9668) and MMCP (1.8566). Moreover, the error correction term (ECT) statistics reported a negative and statistical significant t-stats value (-35.9241; p<.05). This means that the model possessed a strong convergent ability and good predictive power. Also, the model accounts for 50.18% total variance of the level of precision (Ajd. R-square). The Durbin-Watson stat of 2.01233 shows the weak autocorrelation attribute of the model, while the statistical significance of the F-

statistic p-value (p<.05), indicates the statistical significant predictive power of the model to explain the behaviour of SA REIT dividend return in an asymmetric market information period. The model attributes such as weak autocorrelation and statistical significant p-value (p<.05) demonstrated a good predictive power and the reliability of the estimate. The significant explanatory power of bid-ask spread to explain variance in REIT return in the SA REIT market is aligns with findings in other REIT markets across the globe, including the U.S. (Feng, 2021) and U.K. (Devos, et. al., 2019) REIT markets. Feng (2021) noted that information spread is critical to investor confidence. Asem, et al., (2022) added that high level of information transparent gives the REIT vehicle a competitive edge in the stock market. However, the negative relationship of bid-ask spread and the divided return, meaning that the wider the spread (information asymmetry), the lower the dividend returns, thus signalling adverse effects.

Table 6: Causal relationship Dynamics between SA REIT market dividend Return and Information Asymmetric Indicators

Long Run Relation Dynamics			Short Run Relation Dynamics		
Indicators	**Coefficient**	**t-Statistic**	**Indicators**	**Coefficient**	**t-Statistic**
MRDR	-0.0409	-2.1685*	D(MRDR(-1))	-0.040887	-2.16624*
MSPD	-0.2697	-6.7886*	D(MSPD(-1))	-0.269616	-6.78442*
MTNV	0.0022	1.3669	D(MTNV(-1))	0.002207	1.36590
MVIX	0.0476	0.1969	D(MVIX(-1))	0.047420	0.19573
MWAP	0.0005	0.9696	D(MWAP(-1))	0.000577	0.96687
MMCP	9.53E-10	1.8612	D(MMCP(-1))	9.51E-10	1.85667
			ECT	***-0.960368***	***-35.9241****

5.0. Conclusion and Policy Implications

The study investigated how REIT Return behaves under an information asymmetry market using the SA REIT market as a case study. The dataset was dividend return, bid-ask spread, turnover, volatility index, average price movement and market capitalization, with a review period from 2007 to 2017. The study employed trend analysis; a con-integration test and a vector error correction model (VECM to evaluate the time series REIT market data. The trend in REIT returns experienced a gentle fluctuation, turbulence swings were observed in the bid-ask spread and turnover trends, while market cap witnessed expansion from late 2009, the trend in average prices maintains steady growth. The study discovers both long and short run relationships among the REIT returns and the information asymmetry market indicators. Meanwhile, among the information asymmetry indicators, the market spread has a negative

effect and demonstrated a statistically significant explanatory power. This means that the depth and wide of the bid-ask spread explain what happens to REIT dividend return behaviour in the SA stock market in both the short and long run. However, the wider the spread, the higher the level of information asymmetry and the lover the REIT market dividend return. The result ascertained the significant predictive power of bid-ask spread, which has been reported in other REIT markets across the globe. The strong effects of market spread in the REIT stock market necessitate the need to critically evaluate the information asymmetry market condition driven by bid-ask spread by the investors, investment analysts and fund managers. The study, therefore, suggests an efficient and effective information transparent mechanism/policy that could enhance information dissemination and diffusion among the stakeholders in the REIT market.

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FACTORS INFLUENCING THE PERFORMANCE OF CORPORATE REAL ESTATE MANAGEMENT IN LISTED ORGANISATION IN NIGERIA

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Abstract

The study determined the factor influencing the performance of CREM in listed organisation in Nigeria with a view to providing information that could enhance the productivity of the listed organisation. Quantitative and qualitative data was used for the study and was sourced from the listed business organisation in the Nigeria Stock Exchange Market which comprises of 171 companies in the Financial, Industrial, Oil and gas, Consumer, Technology, Basic Material, and Health sectors respectively. Total enumeration was done on the 171 companies through questionnaire administration and for the qualitative data, seven (7) organizations purposively selected was interviewed, representing one organization from each of the seven sectors. Both Factor and Content analysis were used in analysing the responses gotten from the survey. The study revealed that the five major factors influencing the performance of CREM in the listed organisations were Economic/Organisational, Strategic Planning/Management, CRE unit efficiency, User's Satisfaction and Political/Institutional Factors; which altogether explained 64.89% of the variance determining the CREM performance. The study therefore established that the most important factor influencing the performance of CREM in the sectors were the Economic/Organisational Factors. The findings of this study will therefore aid the organisations listed in the Nigeria Stock Exchange market to obtain information that could be used to improve the level of CREM performance in order to enhance productivity.

Keywords - Corporate Real Estate, Corporate Real Estate Management, Factors Influencing Corporate Real Estate Management.

1.0. Introduction

The competitiveness in business along with the worldwide rebranding of businesses and other performance criteria are forcing corporate organisation to change their mode of work in order to function better and meet up with the ever competitive and fast changing business world (Travassos, 2019; Neely, 1995). In the same vein, other external issues like environmental, economic and political factors have also affected business organisational structures and their growth process (Mba, 2015, Haynes & Appel-Meulenbroek, 2014; Pintea& Achim, 2010). This has motivated a lot of organisations to dive into the ideal of being listed over the years.

Listed organisations are companies that are included in a given stock exchange market, so that their stocks can be traded. To trade in shares in the stock exchange market (SEM), an organisation is expected to meet up to the listing requirements amongst which is its ability to reach the market capital requirement. In Nigeria, the capital requirement is up to the tune of 4 billion naira thus implying that these organisations are required to have a huge capital investment (Nigeria Stock Exchange, 2019). All these have resulted to changes in the business world as the need arises for a better corporate environment along with an excellent performance, which forces corporations to concentrate on other aspects of their business, termed 'the non-core businesses. This aligns with the submission of Lindholm (2008) that the needs for increased efficiency and effectiveness of business have propelled corporate organisations to focus on non-core businesses like corporate real estate (CRE). In view of this, organisations are incorporating a selection of plans to manage their real estate in order to achieve efficient utilization of space and increased productivity.

Corporate Real Estate (CRE) can be termed as the property of an organisation that supports the operations of business activities in order to achieve corporate objectives (Edwards & Ellison, 2004). CRE can have major influence on organisational performance by supporting the core business (Lindholm, 2008). It has the potential of adding value to businesses and contributing to an organisation's overall performance. In this regard, a lot of large organisations are expected to have CREM units in their profile. The CREM unit is meant to help companies in carrying out all the functions that will aid the smooth operation and better performance of the business and this department ensures in most instances, that they work in line with the set goals of the organisation.

Brown *et al.* (1993) defined CREM as the management of real estate properties that are in use

by organisations to achieve core objectives. Also, it involves the management of land and building whether developed or undeveloped. CREM entails all activities carried out in building which include investment, management, construction and facilities management. However, for CREM's function to be properly and effectively managed, a continuous process of evaluating the performance of CREM is very vital since it will identify and provide information on the appropriate level of improvement required (Varcoe, 2002). Evaluating CREM performance is necessary taking into cognisance that a lot of CRE has been under-managed by organisations (Oladokun, 2015). This is despite the utilisation of different strategies (internal and external) aimed at increasing the added value of CRE in both the developing and developed economy (Boakye & Bugri, 2019; Haynes & Appel-Meulenbrok, 2014 and Lindholm &Gibler, 2006).

In Nigeria and other developing countries, capital investment to CRE appears to be on the increase in the recent past (Oladokun, 2015). Corporate organisations like banks, insurance companies, telecommunication firms, oil and gas companies are observed to be investing and acquiring real estate (space) for their operations (Onamade & Adejugbe, 2014). Therefore, deciding to own real estate is quite easy with the availability of funds but understanding how CRE and CREM works can be quite difficult. This is because there are various expectations from different users of CRE and its management unit (CREM) which might indicate that the importance of CREM in achieving organisational goals are being trivialized by most corporations. In support of this, Oladokun (2015) asserted that CRE in Nigeria is an undervalued asset in most organisations which require miniature or no technical education to handle. Against this backdrop, this study intends to analyse the corporate real estate management performance in the listed organisations in Nigeria.

Although, few studies have been carried out in the developing economy like the study of Oladokun (2015) which examined the use of CREM as a contributor to organisations' growth and development in Nigeria. The study's finding that active organisations utilise CRE to reduce operation costs, particularly occupancy costs thereby optimizing resources for improving efficiency of other resources of organisations is narrower in scope and different in focus. Also, the investigation only considered the organisational factors which according to Haynes and Appel-Meulenbroek (2014) are the internal factors. External factors that could have great impact on CREM were not considered. Therefore, there is a need for a study that could consider both the internal and external factors in analysing the performance of CREM which is applicable in the Nigeria context, hence, this study.

2.0. Literature Review

Huisman, Apel-Meulenbroek, Koty and Arentz (2021) identified the underlying benefits south by decision makers when making nursing home real estate decisions. The method of analysis was through interview. The findings revealed that beyond financial considerations, decision makers also consider non-financial consideration like functionality, physical and functional flexibility along with technology as main deliberations when undertaking CRE decisions in order to align with the organization's strategic goals.

Ayantoyinbo and Odepidan (2018) investigated the effect of outsourcing on organisational performance. The study looked at the impact of outsourcing of non-core activities on organisations' performance. The study was carried out with the seven up bottling company in south western Nigeria. The study concluded that outsourcing has positive benefit for reduction of cost and service performance and therefore recommended that by outsourcing non-core functions, organisations can provide better services to clients and improve performance. Choy and Gong (2015) determined the relationship between CRE occupancy cost and financial and telecommunication companies in U.S. The study examined 500 organisations, using regression analysis in analysing the data gotten from the firms. The study checked the correlation of share price, net income and occupancy cost. The study examined the similarities and differences between the two sectors. The study found that CRE is more required by financial sector than technology sector. The authors recommended that focus should be shifted to technology sector when it comes to CRE services because it is believed that this will yield more result.

Oladokun (2013) explored the influence of attributes of business executives on the management of corporate real estate. The aim of the study was to investigate the attitude of the business executives to the use of CRE. The sample population were estate surveyors, commercial banks, insurance companies and telecommunication companies. The author found that business executives attached little importance to CREM as well as the use of real estate and therefore concluded that the business executives attached greater value to satisfying their client and development of their brands. The study recommended that there is need to shift focus to the management of CRE by various business executives globally especially in Africa.

Ridzuan and Ali (2012) focused on various factors affecting the management of top business corporation in Malaysia in relations to CRE. The study examined real estate practitioners and

head of organisations for the study. The study identified factors such as level of awareness, organisational background, personal belief, value of business, knowledge on CRE, level of involvement on CREM issues, types of business, work experience and type of industry. The study concluded that the highlighted factors were the major motivators of CREM.

Similarly, Kaluthanthri (2009) examined the factors influencing CREM in commercial banks of SriLanka. The study evaluated three broad factors namely corporate factors, environmental factor and portfolio factors. The variables measured under corporate factors include the type of industry/ business, firm size and style of management among others. Also, economic, industry life cycle, competition was used in measuring environmental factor. The portfolio factors were measure with asset value, locational spread, asset size and attitude towards management. The study found that CREM is low in commercial banks in the study area. The study established that corporate and portfolio factors influence CREM while environmental has no influence. The study concluded that CRE was highly undermanaged.

Tay and Liow (2006) examined CREM practices in Singapore and its performance. The study also highlighted factors influencing CRE performance and its management. The study population was listed firm in Singapore. Data was analysed using regression model. Factors were existence of property unit, CRE organisation/ planning, data base presence, size of firms, location of property, environmental factors and number of properties. The study concluded that the CREM in the study area is underdeveloped compared to CREM in US. The study recommended that organisations should be equipped with strategic planning and technological tools to improve CREM.

Edwards and Ellison (2004) worked on corporate property management and how to align both real estate and business strategies. The study identified property characteristics, user's characteristics, organisational characteristics and institutional characteristics. Property characteristics examined include the physical characteristics, legal characteristics, performance and value of property. Users' characteristics include land owner, government owned and syndicated type of user. Institutional characteristics include formal, informal and detailed. The variables examined under organisational characteristics are business strategy and portfolio characteristics.

Berker and Pearce (2003) explored the influence of human resources factors on CRE. The factors considered were turn-over, productivity and wage-sales. The study used Corneal balanced real estate assessment model (COBRA) to examine these factors. Samples population was real estate managers. The study found that measurement of productivity of

CRE was difficult. The study concluded that the decision relating to organisations was mostly influenced by subjectivity.

The conceptual study of Oluwoye, Karantonis and Fakorede (2001) examined the management of CRE theoretically. The author opined that operational, organisational, acquisition or leasing, real estate asset disposal, outsourcing and financial factors influences CREM. The operational issues include economy, globalization, changes in technology, productivity, benchmarking and segmentation of industries and level of flexibility. The organisation factors include strategic management, functions, practices e.g., finances and site selection, technology and measurement. The study concluded that considering the current globalization level, technology and cultural factors, the inclusion of CRE functions in organisations will be important.

3.0. Methodology

This study adopted both the quantitative and qualitative technique. For the quantitative survey, total enumeration was adopted. The reason for this was because of the restricted size of the organizations and to also ensure that sufficient, substantial, and reliable information are derived for the study. Thus, 171 companies listed in the Nigeria Stock Exchange were administered questionnaire of which 152 were retrieved and was used for the analysis. However, for the qualitative survey, purposively sampling was adopted. Seven (7) organizations were purposively selected comprising of one (1) representative sector from the listed organizations in the Nigeria Stock Exchange. Morse (1989) gave credence to this method of selection adopted where he emphasised that the qualitative sample tend to be purposive rather than random. This number was selected because it was considered sufficient to provide an in-depth study to represent each sector since literature indicates that in each sector in the NSE their mode of operation is similar because they have the same regulatory bodies that guide the procedures involved in operation and information obtained during the preliminary survey also established that the mode of operation was similar. Factor analysis was used to analyse the quantitative data while Content analysis was used to analyse the qualitative data.

4.0. Findings

4.1 Factors Influencing CREM Performance

Presented in Table 1 below is the perception of the respondents about the factors determining CREM performance in the different sectors. From the foregoing results, it is observed that the level of importance attached to the factors influencing CREM performance varied within and across sectors. For instance, findings established that customer satisfaction was perceived to be a very important factor in all the sectors. It ranked first in the consumer, oil and gas, technology, basic material and health sectors while it was rated as second and third in the industrial and financial sectors respectively. The implication of this is that customer satisfaction is a very important factor that can influence the performance of CREM. Nourse and Roulac (1993) and Denheijer (2011) supported this finding. They stated that satisfaction improvement was part of the function of CREM although other functions were mentioned. The interviewee opined that customer satisfaction is a very important factor in the organisation and CREM plays a major role in achieving this because the CRE managers handles everything related to CRE that might have attracted the customers in the first place. Another interviewee in the HS said that customer satisfaction is very vital because the number of customers is relative to the growth process of the organisation; hence organisations put measures in place to ensure their customers are satisfied generally.

Aside from customer satisfaction, competence of staff was another important factor across the sectors. It was the most important factor in the industrial sector while it ranked second in the oil and gas and basic material sectors. While the factor was rated third in the health sector, it ranked fifth in the consumer and technology sectors and seventh in the financial sector. Notwithstanding, it was observed that the factor was very important in all the listed organisations as seen from its average in the different sectors. Moreover, staff competence is vital in CREM performance since it has to do with the ability of CREM staff to carry out their duties efficiently. This was established from the findings of Lindholm (2006, 2008) and Lindholm & Gibler (2008) where competence of staff is part of the variables in CRE unit efficiency that ensures that customers are satisfied with CRE and its management. Interviews conducted further supported the findings. The participants in the FS, CS, OGS and HS noted that their organisations apply the principle of rating staffs regularly to measure how they are performing which in turn motivates them to always perform competently.

Whereas, factors like trade and tariff control, green and smart buildings were considered less important across the sectors. This could be true considering the fact that it might be one of those factors that do not have any impact on CREM performance. Trade and tariff have to do with taxes charged on importation of goods from foreign countries. Timm (2018) established that government utilize tariffs in managing the politics of international economic integration

and in this case CREM has no direct relationship with importation of goods. Green and smart buildings on the other hand are related to environmental factors as established in the study of Haynes and Appel-Meulenbroek (2014). Although, the researchers stated that green and smart can enhance CREM performance, the findings established that in the listed organisation across Nigeria, this was one of the least important factors and this might be as a result of the nature of business and also due to the fact that the importance of such new innovations have not been fully recognised in Nigeria.

Table 1: Factors Influencing the Performance of CREM Within &Across the Sectors

CREM Factors	Financial		Industrial		Consumer		Oil & Gas		Technology		Basic Material		Health		All Sectors	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Location in terms of amenities and transportation	4.88	1	2.83	33	4.63	11	4.63	6	4.70	13	4.89	4	4.67	9	4.46	15
High level of communication	4.79	2	4.74	7	4.43	19	4.65	5	3.30	33	4.58	15	4.67	9	4.45	16
Customer satisfaction	4.74	3	4.94	2	4.95	1	4.93	1	4.92	1	4.95	1	4.97	1	4.91	1
Governmental policies	4.72	4	4.64	13	4.21	26	4.61	7	4.85	7	4.53	18	4.64	13	4.60	8
Low loss and cost	4.71	5	4.36	22	4.66	9	4.31	15	4.85	7	4.84	8	4.67	9	4.63	6
Existence of real estate unit	4.68	6	3.35	27	4.38	22	3.70	27	4.51	21	1.68	37	4.69	8	3.86	28
Competence of staff	4.65	7	4.95	1	4.82	5	4.89	2	4.89	5	4.93	2	4.85	3	4.85	2
Land use planning laws	4.65	7	4.75	4	4.62	13	4.73	4	4.90	3	4.68	13	4.47	19	4.69	4
Image and branding	4.64	9	4.75	4	4.85	3	4.54	11	4.83	9	4.88	6	4.77	4	4.75	3
Preference to lease / own	4.63	10	4.59	16	4.55	15	3.83	21	4.60	18	4.83	9	2.13	39	4.17	21
Management attitude	4.62	11	4.41	21	4.33	24	3.78	23	4.91	2	4.37	25	4.08	25	4.36	17
Nature of CREM in the business	4.62	11	4.71	8	4.64	10	4.60	8	4.70	13	4.58	15	4.66	12	4.64	5
mode of management (in-house, hybrid or outsource)	4.58	13	4.32	24	4.53	16	3.83	21	4.26	23	4.89	4	4.87	2	4.47	14
Strategic planning	4.57	14	4.64	11	4.90	2	4.30	16	4.62	17	4.59	14	4.73	5	4.62	7
Taxation	4.54	15	4.70	9	4.84	4	4.57	9	4.75	11	4.79	10	4.03	26	4.60	8
Adequacy of accommodation	4.50	16	4.78	3	4.81	6	4.75	3	4.52	20	4.88	6	3.33	33	4.51	13

Existence of property database	4.50	16	4.45	18	4.63	11	3.26	33	4.07	27	4.42	23	1.93	40	3.89	27
Work capital reduction	4.42	18	4.36	22	4.74	8	4.37	12	4.89	5	4.69	11	4.59	16	4.58	10
High level of risk management	4.42	18	4.60	15	4.76	7	4.57	9	4.60	18	4.42	23	4.58	17	4.56	11
Population growth	4.34	20	4.75	4	4.17	28	3.74	26	4.63	16	4.69	11	3.87	28	4.31	18
Availability of technology (s/media & internet)	4.32	21	3.75	26	4.62	13	3.96	20	4.72	12	4.55	17	3.00	36	4.13	22
CRE planning	4.20	22	4.44	19	4.43	19	4.06	19	4.29	24	4.26	27	4.12	24	4.24	19
Economic change	4.16	23	4.64	11	4.02	31	4.29	18	4.90	3	4.90	3	4.73	5	4.52	12
Staff training hours	4.15	24	3.13	30	4.48	18	4.33	14	4.20	24	3.11	33	4.73	5	4.02	25
Promotion of new innovations	4.11	25	4.44	19	4.19	27	3.65	28	3.93	28	4.47	20	4.53	18	4.19	20
Quality of outdoor environment/ property characteristics	4.07	26	2.09	40	4.37	23	4.30	16	4.81	10	4.47	20	4.38	21	4.07	24
Value of property	4.07	26	3.15	28	4.08	30	3.22	34	4.81	10	4.45	22	4.13	23	3.90	26
Work space	4.03	28	4.65	10	4.02	31	3.77	25	3.40	32	4.31	26	4.60	14	4.11	23
Availability of un-interruptible power supply	3.96	29	3.05	31`	1.44	37	3.78	23	2.10	34	1.43	38	3.49	32	2.75	38
Size of firm and asset	3.86	30	3.00	32	3.86	33	2.04	37	3.80	30	3.63	30	4.60	14	3.54	29
Lifestyle of clients	3.84	31	2.11	39	3.67	34	3.48	30	1.40	39	3.63	30	3.54	31	2.95	35
Presence of research and development	3.67	32	4.11	25	1.38	38	3.57	29	1.15	40	1.84	36	4.17	22	2.84	37
Leave absence	3.53	33	2.19	38	4.40	21	1.61	40	3.70	31	3.40	32	3.93	27	3.25	33
Alternative workplace	3.41	34	2.33	36	4.33	24	1.96	39	4.29	22	3.68	29	3.87	28	3.41	30
Age	3.37	35	2.46	34	4.50	17	3.43	31	1.90	36	1.38	39	3.60	30	2.95	36
Level of bureaucracy	3.27	36	3.14	29	1.10	40	4.37	12	3.90	29	4.15	28	3.33	33	3.32	31
Level of awareness	3.19	37	4.49	16	1.14	39	3.43	31	1.50	38	4.53	18	4.47	19	3.25	33
Trade and tariff control	2.99	38	2.30	37	2.90	36	2.04	37	2.00	35	2.16	35	2.47	37	2.41	40
Green and smart building	2.50	39	2.35	35	4.13	29	2.83	35	1.90	36	1.21	40	2.27	38	2.46	39
Property protection legislation	2.35	40	4.61	14	3.31	35	2.43	36	4.70	13	2.58	34	3.13	35	3.30	32
Group Mean	**4.13**		**3.90**		**4.07**		**3.83**		**3.99**		**3.98**		**4.06**		**3.99**	

Authors survey, (2022)

As summarized in Table 2, the ANOVA results (F= 0.474; *p* = 0.828) computed revealed that there is no significant difference between the factors influencing the performance of CREM across the different sectors. This implies that the factors influencing the performance of CREM are similar and this might be considered so because these organisations are all listed in the NSE and the fact that they have similar ownership structures.

Table 2: ANOVA for Factors Influencing the Performance of CREM Across the Sectors

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups (Combined)	2.609	6	.435	.474	.828
Within Groups	250.530	273	.918		
Total	**253.139**	**279**			

Furthermore, the forty (40) factors examined were reduced into small group of constructs through Principal Component Analysis (PCA). This was done to determine the major determinants of CREM performance using the aggregate data. Moreover, there was no significant difference in the factors influencing CREM performance across different sectors.

The PCA analysis was done in two stages. The first stage was checking for the suitability and the adequacy of the data using Kaiser-Meyer Olkin (KMO) and Bartlett's test of Sphericity. As presented in Table 3, the data were considered suitable for PCA since the KMO value was greater than 0.5 and Bartlett's test was less than 0.05.

Table 3: KMO and Bartlett's Test for Performance of CREM in the Listed Organisations

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.798
Bartlett's Test of Sphericity	Approx. Chi-Square	3283.026
	Df	253
	Sig.	.000

As stated earlier, forty variables identified in the literature were ran through factor analysis. Using PCA, variables with low communality values (less than 0.5) were removed from further analysis. This is because communality value shows the proportion of variance in each variable that is shared with other variables. Twenty-two (22) variables had their community values greater than 0.5 and these were retained and were considered fit for factor analysis (See Table 4)

Table 4: Communalities for CREM's Performance in the Listed Organisations.

	Initial	Extraction
Customer satisfaction	1.000	.680
Economic change	1.000	.620
Adequacy of accommodation	1.000	.831
Taxation	1.000	.612
Land use planning laws	1.000	.772
Quality of outdoor environment/ property characteristics	1.000	.669
Low loss and cost	1.000	.599
Image and branding	1.000	.602
Governmental policies	1.000	.543
Management attitude	1.000	.720
Preference to lease / own	1.000	.713
CRE planning	1.000	.729
Competence of staff	1.000	.765
Availability of technology (s/media & internet)	1.000	.698
Work space	1.000	.574
Population growth	1.000	.720
High level of communication	1.000	.620
Strategic planning	1.000	.664
Mode of management (in-house, hybrid or outsource)	1.000	.519
Nature of CREM in the business	1.000	.598
Location in terms of amenities and transportation	1.000	.566
Work capital reduction	1.000	.733

Extraction Method: Principal Component Analysis.

The rotated component matrix for the five components is as presented in Table 5. It was used to distinguish the highly loaded factors from the low loaded factors. From component 1, seven (7) variables were loaded and the variables were work capital reduction (0.819), low loss and cost (0.764), quality of outdoor environment/property characteristics (0.739), economic change (0.702), taxation (0.690), image and branding (0.680) and CRE planning (0.606). The variables pertain mostly to economic and organisational factors hence it was named **'economic/organisational factor'.** Strategic planning (0.806), high level of communication (0.770), nature of CREM in the business (0.759), population growth (0.752), work space (0.725), location in terms of amenities and transportation (0.674), mode of management (0.612) was loaded in component 2. These were related to strategic planning and management. Hence, the variables were named **'strategic planning/management factors.** Four (4) variables loaded on component 3 were competence of staff (0.838), availability of technology (0.826), management attitude (0.817), and preference to lease/own (0.678). These variables suggested CRE functions and tools utilised. Hence, this

was termed '**CRE unit efficiency'.** In the fourth component were two (2) variables. These were adequacy of accommodation (0.819) and customers satisfaction (0.789). These variables were related to user's satisfaction of CRE. Hence it was termed u**ser's satisfaction.**

Table 5: Rotated Component Matrix for Performance of CREM in the Listed Organisations

	Component				
	1	2	3	4	5
Work capital reduction	.819				
Low loss and cost	.764				
Quality of outdoor environment/ property characteristics	.739				
Economic change	.702				
Taxation	.690				
Image and branding	.680				
CRE planning	.606				
Strategic planning		.806			
High level of communication		.770			
Nature of CREM in the business		.759			
Population growth		.752			
Work space		.725			
Location in terms of amenities and transportation		.674			
Mode of management (in-house, hybrid or outsource)		.612			
Competence of staff			.838		
Availability of technology (s/media & internet)			.826		
Management attitude			.817		
Preference to lease / own			.678		
Adequacy of accommodation				.819	
Customer satisfaction				.789	
Land use planning laws					.864
Governmental policies					.576

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

On the fifth component were land use planning laws (0.864), governmental policies (0.576). These variables suggested government and land use planning laws. Hence, it is called **'political/institutional factors**. Eigenvalues associated with each of the five components after rotation are as summarised in Table 4.67. From the Table, it could be observed that factor 1, 2, 3, 4 and 5 respectively accounted for 20.0%, 17.0%, 13.2%, 8.3% and 6.4% variance respectively after rotation. In essence, economic/organisational factors (component 1) explained 20% of the total variance as strategic planning/management (component 2) and CRE unit efficiency (component 3) factors were accountable for 17.0% and 13.2% variance respectively. User's satisfaction explained 8.3% of the total variance while

political/institutional factor explained 6.4%. Collectively, the five factors explained 64.9% of the variance in determining CREM performance in the listed organizations. The other factors not included and which may also influence CREM performance amounted to 35.1%.

Table 6: Variance Explained for Factors Influencing the Performance of CREM in the Listed Organisations

Component	Factors	Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %
1	Economic/Organisational	4.601	20.006	20.006
2	Strategic Planning/Management	3.918	17.033	37.039
3	CRE Unit Efficiency	3.026	13.158	50.197
4	User's Satisfaction	1.908	8.298	58.495
5	Political/Institutional	1.471	6.396	64.891

Extraction Method: Principal Component Analysis.

In view of the above, the findings suggest that the major factors influencing the performance of CREM across the sectors were 'economic/organisational factor, strategic planning/management, CRE unit efficiency, user's satisfaction and political/institutional factors. To corroborate these findings, a top official interviewed in the FS said that the micro and macro-economic factor has affected the role of CREM in the developing economy like Nigeria because CREM can function better with the availability of finance which the present economy situation is hindering. The interviewee also mentioned factors like strategies, work space, work capital reduction, land use planning laws, tax, governmental policies as factors also influencing CREM performance and this agrees with the previous studies of (Langford & Haynes 2015; Haynes, 2012; Kaluthanthri, 2009; Lindholm, 2008; Lindholm, Gibler & Lovainen, 2006; Tay & Lion 2006; Edwards & Ellison 2004; Oluwoye, Karanforus & Fakorede 2001) that have established that these factors affect CREM performance in an organisation.

5.0. Conclusion

CRE in Nigeria over the years has been considered to be under-managed by must organisation and this has been said to have resulted in CREM's inability to perform well. However, this study has made available vital information into CREM's performance in the various organisations in Nigeria. it has also endeavored to bridge the gap in knowledge relating to CREM and its practice in Nigeria. The result of the current study brings to the insight that CRE in Nigeria is gradually moving from the notion of being seen as a cost approach to a strategic tool used by corporation to bring in added value to business productivity and profitability and

this has been achieved by the strategic planning of CREM. The study concludes that CREM performance in the listed organisations is influenced by factors such as organisational, strategic planning/management, CRE unit efficiency, economic and institutional factors. However, it is important to understand that an organisation without a proper CREM structure, adequate management style along with strategic planning will not be influenced positively.

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GREEN BUILDING VALUATION IN THE SOUTH AFRICAN RESIDENTIAL PROPERTY SECTOR: INFLUENCING FACTORS AND BARRIERS TO IMPLEMENTATION

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Abstract

The gains of green buildings are replete in literature. However, the role of the property valuer in the valuation of green buildings still remains unclear. The study aims to assess the barriers and factors influencing the implementation of green building valuation in the residential property sector of South Africa. The research employs a quantitative methodology. The study utilised a closed-ended questionnaire to collect data from professionally registered Valuers at the South African Council for the Property Valuers Profession, in the Gauteng province. Statistical techniques such as frequency count, percentages and mean item score were employed in analysing the data. The result showed that the majority of the respondents agreed that the initial cost of green buildings is higher than conventional buildings. Though, the operational costs often tend to offset this initial cost in the long run. Furthermore, the study found that water and energy efficiency features and materials used for construction are key inputs in the valuation of green buildings. Also, the major challenges to green building valuation are the few numbers of the residential green building stock and the lack of cost data on green buildings. The study concludes on the need for collaboration among various stakeholders such as developers, valuers and green-certifying organizations to make cost data available to property valuers and create a sharing platform where such information can be accessed and used by valuers to arrive at credible value opinions on green buildings. Also, the role of property valuers is germane towards ensuring that the value of properties reflects the green building element, therefore their knowledge of sustainability becomes critical.

Keywords: *green building, sustainability, property valuers, residential property, market value.*

1.0. Introduction

Globally, buildings consume large amounts of energy and they are great contributors to global warming through the release of greenhouse gases (Sagheb *et al.,* 2011). The conventional way of constructing a building is associated with substantial production of waste and environmental pollution (Kyjakova and Baskova, 2016). To minimize these negative effects that come with construction activities, there has been an increasing trend toward green building (Modise, 2018). Thus, while there has been an increasing demand for green buildings and the attendant benefits of green buildings are largely known, the extent to which these investments translate into value still remains unclear.

According to Sustainable Energy Africa (2015), South Africa is the 12th highest greenhouse gas emitter in the world. Moreover, the majority of buildings in South Africa, especially residential buildings are still constructed using the conventional building approaches which are not aligned with sustainable development (Kyjakova and Baskova, 2016). Thus, while green buildings come with a high initial cost and present a scenario of quantity versus environmentally friendly options (Djokoto *et al*., 2014; Olaleye *et al.,* 2015), there is still a gap in ascertaining the role of the valuer in determining market premiums for green buildings, as against conventional buildings.

While green buildings are usually associated with high initial costs, the savings on operational costs tend to outweigh the initial cost (Gadonniex and Riley, 2009). However, property developers, in general, face challenges when it comes to green building. One of such challenges mentioned in the literature is the low value attached to green building and the lack of market data on green building since it is considered a relatively new field (Pitts and Jackson, 2008). Though South Africa has made reasonable progress in terms of green building in the commercial property sector, 140 office buildings are already certified by the Green Building Council of South Africa (GBCSA) (Mahlaka, 2015). In comparison, the residential property sector, however, lags behind the commercial sector in terms of certified green buildings (Mahlaka, 2015; Handerhan 2012).

Even though there are increased efforts geared at increasing green residential housing stock, it suffices to note that investors' willingness to invest in green building is only guaranteed where there are sufficient economic benefits and a commensurate return on investment (Galuppo and Tu, 2010). Extant studies have noted that investing in green buildings creates financial value such as an increase in asset value, reduction in depreciation and increased

rental rates (O'Mara and Bates, 2012). Other studies such as Myers *et al.* (2007); Schumann (2010) and Sinha *et al.* (2013) submitted that green building has multiple benefits such as the competitive advantage of the property and high investment returns. However, Handerhan (2012) states that despite the numerous efforts being made at increasing green building stock, the residential property sector still lags. Qian *et al.* (2015) argued for the need to raise awareness of the value of green buildings. O'Mara and Bates (2012) emphasised that investors need to see the opportunity of investing in green buildings as this creates a competitive edge and enhances return on investment.

If stakeholders including the government and investors understand the market premiums attached to green buildings, there is likely to be a significant shift from conventional buildings to green buildings (Hoffman and Henn, 2008; Olaleye *et al.,* 2015). Thus, while these bring to the fore the role of the property valuers in ascertaining the market value of green buildings, property valuers, however, face a lot of challenges when it comes to "*going green*" (Pitts and Jackson, 2008). Among the challenges faced are the lack of support by the government in implementing green building policies (Nguyen and Gray, 2016), inadequate cost data (Simpeh and Smallwood, 2015) and lack of awareness of the financial and economic benefits of green buildings (Qian *et al.,* 2015). Thus, despite these perceived value-adding benefits of green buildings, these inherent challenges seem to hinder the valuation of green buildings. Also, the role of the property valuer in promoting the valuation of green buildings seems unclear. Towards this end, the study assessed the barriers and factors influencing the implementation of green building valuation in the residential property sector of South Africa. Specifically, the study answered the following research questions:

1. What is the perception of property valuers on the cost associated with green buildings?
2. What are important factors for green building valuation?
3. What challenges are involved in the valuation of green residential buildings?

2.0. Literature Review

Costs Associated with Green Building

There have been attempts to quantify the cost of green buildings since the inception of the green building concept. The case for green building stems from two major cost perspectives, the first is the initial construction costs and the other is the operational cost during the life of

the building.

From the perspective of the initial development cost, Rehm and Ade (2013) argue that while extant studies have elaborated on the benefits of green building, there is little evidence of the capital cost implications. A study conducted by the Green Building Council South Africa (GBCSA) (2016), reports that "the average cost premium of building green over and above the cost of conventional construction – or green cost premium – is a mere 5.0% and can be as low as 1.1%". The study challenged the belief that green buildings cost much more than conventional buildings, thereby supporting the submission of Matthiessen and Morris, (2004) that green buildings do not necessarily cost significantly more than conventional buildings.

Analysis of the operational costs of green buildings shows that buildings that are EDGE certified result in a minimum of 20% savings in energy, water usage and reduced energy (Ecolution Consulting, 2017). Similarly, Hardcastle (2015) states that the most important benefit of green buildings is the lower operating costs, as cost savings are realized through the operational cost when compared to conventional buildings. This is achieved through lower energy consumption and total lifecycle cost. Fowler *et al.* (2010) state that green buildings will also have low maintenance costs.

Thus, the case for green buildings from the perspective of costs, *that is*, the initial cost of construction and/or operational costs could be expected to vary across property types. Suttell (2006) submitted that the construction industry lacks accurate and quantifiable data on the economic impact of efficient building, especially in the residential sector. Hence, more empirical investigations could be required across different property types to ascertain/validate these perspectives. However, when stakeholders have clear goals and focus on the bigger picture when implementing green building, it can be realized that the initial costs are relatively insignificant compared to the benefits that can be achieved in the long run.

Impact of Green Building on Market Value and the Role of the Valuer

One of the economic benefits of green building is increased income, which is achieved through higher tenant retention, occupancy rate and rental growth as well as the attraction rate (Coetzee and Brent, 2015). According to Yiu (2007), green buildings will result in reduced risk of depreciation due to the latest technologies and materials used in the design, construction and operation of the building, which in return increases the building life span.

The United States Green Building Council (2015) reports that the market for buildings with green certifications increased by 10 to 14 per cent more than conventional buildings without green certifications.

The foregoing suggests that property valuers have a key role to play in promoting and implementing green building certifications. Thus, they are tasked with the difficult role of calculating the green building criteria and incorporating them into their valuation model (Jayantha and Man, 2013). To compound the challenge, there is a lack of reliable cost data on green residential buildings (Simpeh and Smallwood, 2015). However, Lorenz and Lützkendorf (2008) state that while the need to reflect sustainability in property value is possible, the validity of such a task depends on the skills and capability of the Valuer as well as the availability of cost data on green building.

Given the reported benefits of green building, it is undeniable that going green affects the market value of the property (Ajibola, 2015), but the problem lies in the difficulty of quantifying the value of those benefits (Pitts and Jackson, 2008) and the market premiums of such properties. Abdullah *et al.* (2018) summarize the role of Valuers in green building to include preparing a valuation report and analyzing the market, identifying and analyzing green building features, collecting data and information on services, acquiring knowledge of green building and providing an opinion on value and advice. This implies that Valuers must have knowledge of green building to prepare a thorough valuation report of a green property. It also implies that Valuers must be able to reflect on market analysis and pay attention to trends to value green property accurately.

Thus, the role of Valuers indirectly influences green building valuations, as they are tasked with the duty of attaching value to buildings that are considered green. According to Abdullah, *et al.* (2018), the Valuer is responsible to ensure that the value reflects the element of green. Kucharska-Stasiak and Olbińska (2018) state that property valuers need to develop more than just a market value but a "*new value*" which will highlight not just the economic benefits but also the social, environmental, ethical and moral features.

The Valuation of Green Buildings

Property Valuers are tasked to assess the worth of real estate investment. Hence, the knowledge of green building is essential (Ajibola, 2015). Extant studies such as Kuiken (2009), Sayce and Ellison (2003) and Schumann (2010), have noted that factors such as the location of the building, the design, functionality and flexibility of the property, material used to

construct the building, energy and water efficiency of the building, pollutants of the building and surrounding area, income expected, risks of green development, and supply and demand of green building should be considered when valuing green buildings.

There is however limited residential green building and a lack of cost and/or market data which pose a challenge to the valuation of residential green buildings. Myers et al. (2007) noted that the market value approach is difficult to use when dealing with sustainability aspects in buildings. While the methods which are used to value a conventional building still apply to green buildings, it is required that Valuers have to take into account the green futures attached to the building and add a risk premium (Marjanovic-Halburd, 2015). Kuiken (2009) suggests that the best method of valuing residential green buildings is the income approach method as this method focuses on income-generating properties and reflects future market expectations, while the other two methods present weaknesses that make them inappropriate to value green buildings. However, Pitts and Jackson (2008) argue that the sales comparison approach is the most appropriate method to value green buildings on the condition that there are other similar green properties. According to Suttell, (2006), a holistic approach does not apply to green buildings as each building is unique and should be valued as such. Hence, for valuers to provide accurate valuation figures for green buildings, all the factors that might affect the value of the property must be considered.

Barriers to Residential Green Building Valuation

These challenges to green building are examined from a generic point of view as well as valuation-specific perspectives. The generic challenges range from incoherent government policies to consumers' resistance to change. For instance, the development and revision of sustainable regulations and policies by the government often take long and contribute to delays in the implementation of green buildings. This primarily impacts property developers as there is a lack of concrete documents focusing on green buildings to ensure that buildings meet certain thresholds (Asian Green Building, 2016). Another challenge is that there are limited incentives and inadequate support by the government for green building uptake (Academy of Science of South Africa, 2014).

Also, there is a perception that green building is associated with high initial cost. Whether real or perceived, it is an obstacle to the growth of green buildings (McGraw-Hill Construction, 2016). Mosier and Gransberg (2013) state that developers who take on green buildings are adding an undetermined incremental cost to their initial budget although there is still uncertainty on the direct cost of green building. The initial cost is offset by the low operating

cost which is realized by calculating the lifecycle cost and the payback period. Pitts and Jackson (2008) point out that the high initial cost can be recouped through energy and operating cost savings.

Further, there is a general resistance to change, and the term “new” may create uncertainty for people, especially where it involves money. According to Sloane (2017), people oppose innovation due to the fear of the unknown and being stuck in their old methods. In addition, due to minimal green technology supply in the market, there is usually no awareness or advertisement to motivate consumers on green buildings. Without clearly presenting the details of the benefits and costs, with their associated extra risks, potential stakeholders could still be discouraged from entering the green building market voluntarily (Qian *et al.,* 2015).

Finally, there is a lack of resources, skill gaps and education in implementing green technology, especially in small organisations (Academy of Science of South Africa, 2014). Thus, there is a need for a thorough knowledge of green buildings as professionals do not have the required education and are not fully trained to develop and implement green building practices (Hankinson and Breytenbach, 2012). Green building education should be encouraged. This is because according to Bilau (2008), built environment education lacks emphasis on sustainable design. Jacobs (2015) expresses similar sentiments that there is a lack of academic institutions offering education and training specifically in green buildings.

In addition to the above-mentioned barriers to green building, there are other peculiar challenges that Valuers face. Valuers find it difficult to assess the real market value of green building and one of the reasons is that green building is new in the built environment (McGraw-Hill Construction, 2016). According to Marjanovic-Halburd (2015), the biggest challenge that Valuers face is translating the characteristics of green buildings into financial benefits. Marjanovic-Halburd (2015) noted that there have been few studies on methods to identify the relationship between sustainability and property value. Other challenges identified by extant studies include limited published data on the cost of green building. This often raises difficulty in justifying the initial cost of green building (Simpeh and Smallwood, 2015).

Also, the residential market has been slow to adapt and incorporate green features (Pitts and Jackson, 2008). Thus, owing to the few residential buildings with green features, it is difficult for Valuers to value residential buildings using the market and comparison approach (Ajibola, 2015). Furthermore, valuers' lack of full understanding of the process of valuing a unit with

green features contributes to the low value attached to green buildings (Kuiken, 2009). The focus is usually on the building location, property square meters and style, rather than on energy and water-saving features (Pitts and Jackson, 2008).

Finally, some of the benefits of green building may be enjoyed by the occupier rather than the developer/owner (CB Richard Ellis, 2009). It is argued by some that the developer should be rewarded for incurring the initial costs (Hera, 2011) and should expect a payback period in a few years (Shabrin and Kashem, 2017). Furr *et al.* (2009) suggest that owners must split their benefits with their tenants as the tenant enjoys the benefit of comfort and energy saving while the owner can expect increased income.

3.0. Research Method

The research employs a quantitative research method. The target population for the study was professional Valuers in the Gauteng province, registered with the South African Council for Property Valuers Profession (SACPVP). Thus, the research population consisted of 311 Professional Valuers in the Gauteng region. Gauteng province was selected as the study area because it is the leading province with green building developments in South Africa (Jack, 2016). Owing to the low response rates usually obtained from study respondents, all the 311 registered property valuers were considered in the study sample.

The data collection instrument was a closed-ended questionnaire that was sent out via email to the Professional Valuers in Gauteng, whose contacts were obtained from the SACPVP website after written permission to conduct the research among the members was obtained. The questionnaire consisted of two sections. The first section sought information about the demography of the respondents such as the highest academic qualification and years of experience in the property industry. In the second section, the questions relate to the barriers and the challenges property valuers face when valuing green residential buildings among others.

The questionnaires were distributed via email to the respondents during the period September 2018 to October 2018. Of the total of 311 questionnaires sent out via email to the respondents, only 37 questionnaires were suitably completed, which constitutes an 11.90% response rate. The low response rate might be attributed to respondents' apathy towards the filling of online surveys. Extant studies such as Ayodele and Kajimo-Shakantu (2021), using an online survey, obtained a similar low response rate with construction professionals in South

Africa.

In assessing the perception of property valuers on the cost associated with green buildings, the study first evaluated the perception of the valuers about some common notions/statements as regards green buildings. The respondents were asked to state their level of agreement or disagreement with the statements (Table 1). These were scaled on a 5-point scale from 1 (strongly disagree, SD), 2 (disagree, D), 3 (neutral, N), 4 (agree, A) and 5 (strongly agree, SA). Afterwards, the factors were ranked using the mean item score. Subsequently, the perception of the respondents on the cost of the green building was evaluated using a binary (Yes/No) scale. To analyse the important factors for green building valuation, the respondents rated on a 5-point scale important factors considered when undertaking valuations of residential green buildings; where 1 is not important (NI), 2 is fairly important (FI), 3 is important (I), 4 is very important (VI) and 5 is extremely important (EI).

Table 1: Literature Sources for Factors

Factors	Sources
Statements on Valuers' Perceptions of Green Building	
There is a market for green buildings in the residential property sector.	Yiu, 2007
Property valuers and developers are key participants to promote the implementation of green building in the residential property sector.	Authors' input
Investing in green buildings creates financial value such as increase in asset value, reduction in depreciation, higher tenant attraction and increased rental rates.	O'Mara and Bates, 2012
Limited availability of cost data in the market leads to slow implementation of green building in the residential sector.	Simpeh and Smallwood, 2015
Lack of financial incentives has a negative effect on the implementation of green building in the residential sector.	Nguyen and Gray, 2016
The initial cost of green building is offset by the low operating cost which is realized by calculating the lifecycle cost and the payback period	McGraw-Hill Construction, 2016; Pitts and Jackson, 2008
Barriers to Green Building	
Lack of Government support and incentives	McGraw-Hill Construction, 2016
High capital cost of green building	Pitts and Jackson,2008
Peoples' resistance to change	Sloane, 2017
Lack of market awareness	Qian *et al.,* 2015
Inadequate resources, skill gap and education	Cole, 2013
Challenges in Valuing Green Residential Buildings	
Lack of cost data on green building	Simpeh and Smallwood, 2015
Few residential green buildings in the market	Ajibola, 2015
Low value attached to green buildings	Pitts and Jackson, 2008
Lack of shared benefits between the Developer and Occupier	CB Richard Ellis (2009), Furr *et al.* (2009)

Finally, in analyzing the challenges involved in the valuation of residential green buildings, the study first examined the barriers to green buildings and subsequently assessed the challenges associated with the valuation of residential green buildings. The respondents were presented with a list of factors (Table 1) and were requested to rank these factors on a scale of 1 to 5 (for the barriers) and 1 to 4 (for the challenges). The total rating/score for each factor is summed up and presented as the total score. The total score is further divided by the number of respondents, *that is*, 37, to arrive at an index which is used to rank the factors.

The instrument used for data collection is attached as Annexure. Summarily, the data collected were processed using Microsoft Excel spreadsheets and analyzed using frequencies, percentages and mean analysis.

4.0. Results Presentation and Analysis

Profile of the Respondents

The profile of the respondents is presented in Table 1. The results showed that the majority of the respondents (32.44%) hold a National Diploma as the highest qualification, which was followed by BTech and Masters with the same percentage (13.51%).

Table 1. Respondents Profile

Profile		Frequency	Percentage
Qualification	National Diploma	12	32.44 %
	BTech	5	13.51 %
	BSc	1	2.70 %
	Honours	1	2.70 %
	MSc	5	13.51 %
	PhD	2	5.41 %
	Other	11	29.73 %
	Total	**37**	**100.00%**
Years of Experience	5 years and below	1	2.70 %
	6 – 10 years	2	5.41 %
	11 – 15 years	3	8.11 %
	16 – 20 years	8	21.62 %
	21 years and above	23	62.16 %
	Total	**37**	**100.00%**

The results show that 67.56% of the respondents hold at least a Bachelor's degree in Property studies. When the respondents were grouped according to years of experience, only 8.11% had less than 10 years of experience. The majority of respondents (83.78%) had more than 15

years of property industry experience. The foregoing suggests that most of the respondents have the requisite academic and professional experience to provide valuable insights into the questions being raised.

Property Valuers' Perception of Green Building

The results as presented in Table 2 show that the respondents were in agreement with all the statements as the mean score for each factor was above 3.0, which was the cut-off point. Lack of financial was ranked first, with a mean score of 4.09. Thus, it is perceived as the main constraint to residential green building implementation. The International Labour Office of Geneva (2011) states that the success of government policies and programs in implementing green building depends on the availability of skills in the field. Thus, incentives only cannot bring about the desired level of success if adequate skills are not available. The item ranked second relates to the availability of a market for green buildings in the residential property sector. The finding is in line with the submissions of Yiu (2007). The study noted that there is a market for green building in the residential sector as buildings that are green result in reduced risk of depreciation due to the latest technologies and materials used in the design, construction and operation of the building, which in return increases the life of the building.

Table 2: Perceptions of Green Building

Statements	Mean	Rank
The lack of financial incentives has a negative effect on the implementation of green buildings in the residential sector.	4.09	1
There is a market for green buildings in the residential property sector.	3.85	2
Limited availability of cost data in the market leads to slow implementation of green building in the residential sector.	3.79	3
The initial cost of green building is offset by the low operating cost which is realized by calculating the lifecycle cost and the payback period	3.78	4
Investing in green buildings creates financial value such as increase in asset value, reduction in depreciation, higher tenant attraction and increased rental rates.	3.69	5
Property valuers and developers are key participants to promote the implementation of green building in the residential property sector.	3.03	6

Limited availability of cost data in the market leads to slow implementation of green building in the residential sector was ranked third with a mean score of 3.79. As a result of the slow progress in green building, there are few residential buildings with green features which makes it difficult for valuers to value these buildings using the cost approach, especially where the market and comparison approach cannot be employed. These findings supported Choi (2009) who states that a major barrier to valuing green buildings is the lack of reliable

cost data to justify the high initial cost of green buildings. According to Hoffman and Cowie (2014), this is quite a challenge and it impacts negatively on the growth of green building in the residential property sector

The statement that the initial cost of green building is offset by the low operating cost which is realized by calculating the lifecycle cost and the payback period, ranked fourth with a mean score of 3.78. UNEP (2011) reports that the initial additional capital outlay, the so-called "*first cost*", could be a deterrent for those who demand finance for green buildings". However, Matthiessen and Morris (2004) state that when stakeholders have clear goals and focus on the bigger picture when implementing green building, it will be realized that the initial costs are relatively insignificant compared to the benefits that can be achieved.

According to Lorenz and Lützkendorf (2008), property Valuers are identified as the key professionals to align economic return with the environmental and performance of properties and to market green buildings. The results showed that this statement was the least rated with a mean score of 3.03. It could be stated that while Property Valuers play a big role in promoting green building, they, however, do not seem to perceive themselves as the key participants in promoting the implementation of green building in the residential property sector. The International Labour Office of Geneva (2011) emphasizes that green building is a value chain and achieving green building excellence requires a collective effort from all stakeholders.

Cost of Green Building

The respondents were asked about their experience, knowledge, perceptions and opinions on the cost of green buildings.

Table 3: Green Building Cost

Question	Yes	No
Do you have experience in green building?	62.50%	37.50%
Are initial costs of green buildings higher than conventional buildings?	96.97%	3.03%
Are operational costs of green buildings lower than conventional buildings?	84.85%	15.15%
Do green building features have an impact on the market value of a property?	81.82%	18.18%
Do Property Valuers play a key role in promoting green building in the residential property sector?	26.47%	73.53%

The results presented in Table 3 show that most of the respondents, 62.50% have experience in green building. Also, the majority of respondents (96.97%) are of the view that green building has a higher capital cost than conventional buildings. This is in line with the findings of Hwang *et al.* (2017) where many industry professionals have the perception that green buildings cost 5 – 10% more than conventional buildings, which is a common reason

hindering green building development. While 84.5% of the respondents agree that operational costs are lower in green buildings, 81.82% affirmed that green building features have an impact on the market value of a property. The results also showed property valuers do not currently play significant roles in promoting green building residential stock. This had a percentage frequency of 73.53%. This perhaps might be due to a lack of legislative or regulatory framework guiding the role of property valuers in promoting green building in the residential housing sector.

Important Factors for Green Building Valuation

From the results presented in Table 4, all the factors were considered important to some extent, as all the factors had mean scores greater than the 3.0 benchmark. However, the most highly ranked were 'material used to construct the building', and 'energy and water efficiency of the building' both ranked first and second with mean scores of 4.21 and 4.20 respectively. Functionality and flexibility of the property' ranked third (mean score = 4.18). 'Risks of green development' and 'income expected" were the least ranked factors with mean scores of 3.94 and 3.30 respectively.

Table 4: Influential Factors in Valuation of Green Buildings

Factors	Mean	Rank
The material used to construct the building	4.21	1
Energy and water efficiency features of the building	4.20	2
Functionality and flexibility of the property	4.18	3
The design	4.12	4
Pollutants of the building and surrounding areas	4.03	5
The Location of the building	4.00	6
Income expected	3.94	7
Risks of green development	3.30	8

When analyzing the results, 'material used to construct the building' and 'energy and water efficiency of the building' were ranked as the most important factors. These factors are often regarded as the most important design criteria for green building as stated by Hendler and Thompson-Smeddle (n.d). Further, Sagheb *et al.* (2011) emphasize that for a building to be considered "green" it must use recyclable and eco-friendly materials for construction.

The functionality and flexibility of a property are very important factors. Akadiri *et al.* (2012) noted that buildings must accommodate all the required activities for which it was built. In meeting these requirements, it must not harm the environment (Balramdas *et al.,* 2016). The

result also showed that the location of a building is an important factor when valuing green buildings. This had a mean score of 4.00. This finding supports the submissions of extant studies such as Knox (2015) and Schumann (2010) which submitted that location is a critical element for green building valuation. This is because the size or design of a building can always be altered but the location cannot be changed. Fitzgerald (2016) states that "location creates desirability, desirability creates demand, and demand raises real estate prices". Thus, it might be expected that urban areas/city centres would readily create demand for green buildings. Thus, regardless of whether it is a green building or a conventional building, location has a great influence on the value of a property as it has a massive bearing on a property's potential investment return and the value thereof.

Barriers to Green Building in Residential Property Sector

The respondents were asked to rank the most common barriers that often impede the progress of green building in the residential sector. The results are presented in Table 5.

Table 5: Barriers to Green Building

Barriers to Green Building	Total Score	Mean	Rank
The high capital cost of green building	129	3.49	1
Lack of market awareness	104	2.81	2
Lack of Government support and incentives	104	2.81	2
Peoples' resistance to change	86	2.32	4
Inadequate resources, skill gap and education	77	2.08	5

The result showed that the majority of respondents indicated the high capital cost of green building, with a mean score of 3.49 as a major barrier slowing the progress of green building in the residential property sector. This result corroborates the findings in Table 3 where 96.97% of the respondents believe that green building has a higher cost than conventional buildings. Investors are reluctant to pay the initial cost of green building which is often high, thereby hindering the uptake/construction of green buildings in the residential sector.

Lack of government support and incentives co-ranked second, with a mean item score of 2.81. McGraw- Hill Construction, (2016) states that though there has been increased government support and emphasis on green building, there are no commensurate support in the residential sector and the available incentives are often not enough. Lack of market awareness (mean – 2.81) co-ranked second and inadequate resources, skill gap and education (mean – 2.08) were ranked fifth. Cole (2013) states that the first step in addressing the barriers to the slow progress of green building in the residential sector is through

education and Qian *et al.* (2015) similarly argued for the need to raise awareness of the value of green building.

The Challenges Associated with Valuation of residential green buildings

The results as presented in Table 6 show that the few number of residential green buildings in the market is a major challenge for valuers in conducting valuations of green buildings. This factor was ranked first with a mean score of 3.03, followed by the lack of cost data on green buildings (mean – 2.65), the low value attached to green buildings (mean - 1.54), and lastly lack of shared benefits between the Developer and occupier (mean - 1.43). The low stock of residential buildings with green features often makes it difficult for valuers to value these buildings using the market and comparison approach.

Table 6: Challenges Associated with Valuation of green residential buildings

Challenges in valuing green residential buildings	Total Score	Mean	Rank
Few residential green buildings in the market	112	3.03	1
Lack of cost data on green buildings	98	2.65	2
The low value attached to green buildings	57	1.54	3
Lack of shared benefits between the Developer and Occupier	53	1.43	4

Although the lack of shared benefits between the Developer and Occupier was ranked last, it was found to be a challenge that Valuers encounter. The results indicate that respondents believe that owners should split green building benefits with their tenants but it is not perceived as an important challenge. CB Richard Ellis (2009) states that some of the benefits of green building are enjoyed by the occupier rather than the developer, thereby suggesting shared benefits. A solution to this challenge may be the incorporation of a Green Lease which according to ESI Africa (2017) is a tool for both parties to discharge the shared benefits of *"going green"* and be explicit with the contractual lease obligations between the landlord and the tenant.

5.0. Conclusions and Recommendations

Green building is the way forward for the construction industry to move toward the protection of the environment. Extant studies have highlighted several benefits of green buildings compared to conventional buildings. However, the capital cost of green buildings is often higher than a conventional building which is a barrier to implementing green buildings

in the residential property sector.
The study found that the material used for construction and water and energy efficiency feature are key inputs in the valuation of green buildings. However, the major challenges are the few numbers of residential green building stock and the lack of cost data on green buildings. Furthermore, the result showed that the majority of the respondents agreed that the initial cost of green buildings is higher than conventional buildings. Though, the operational costs often tend to offset this initial cost in the long run.

While the valuers seem not to play a key role in the promotion of green buildings in the residential property sector, their role in the valuation of green buildings cannot be overemphasized. Valuers are required to reflect market analysis and pay attention to trends in order to value accurately. Valuers have to make sure that the value of a property reflects its green element. Therefore, knowledge and skills in green building are vital for Valuers to play a meaningful role in green building valuations. A role which currently seems not fully optimised. It can also be deduced that for property valuers to be able to play a more meaningful role and add more value to the valuation of green buildings, attention must be directed to improving the knowledge levels of valuers in green buildings valuation. There is also a need for collaboration among various stakeholders such as developers, valuers and green-certifying organizations to make cost data available to property valuers and create a sharing platform where such information can be accessed and used by valuers to formulate credible value opinions on green buildings. Also, the role of property valuers is germane towards ensuring that the value of properties reflects the green building element, therefore their knowledge of sustainability becomes critical.

While the study was focused only on Gauteng province, similar studies could be conducted with a bigger sample size of Valuers across the country. Studies could also be undertaken to investigate the impact of green buildings on the market value of a residential property. Given the low response rate, the findings of the study must be taken with caution. However, the results therefrom could provide invaluable insights into the factors influencing the valuation of green buildings in South Africa.

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Annexure: Questionnaire Sheet

Section A

Demographic Information

1. Highest Academic Qualification (a) Matric (NSC) (b) National Diploma (c) BTech (d) BSc (e) Honours (f) MSc (g) PhD (h) Others……..
2. Years of experience in the Property Industry (a) 5 years and below (b) 6 - 10 years (c) 11 - 15 years (d) 16 - 20 years (e) 21 years and above

Section B

B1. Perceptions of Property Valuers on Green Buildings

On a 5-point Likert scale, indicate the extent to which you agree or disagree with each of the following statements. 1 (strongly disagree, SD), 2 (disagree, D), 3 (neutral, N), 4 (agree, A) and 5 (strongly agree, SA)

Statements	SD	D	N	A	SA
There is a market for green buildings in the residential property sector.	1	2	3	4	5
Property valuers and developers are key participants to promote the implementation of green building in the residential property sector.	1	2	3	4	5
Investing in green buildings creates financial value such as increase in asset value, reduction in depreciation, higher tenant attraction and increased rental rates.	1	2	3	4	5
Limited availability of cost data in the market leads to slow implementation of green building in the residential sector.	1	2	3	4	5
Lack of financial incentives has a negative effect on the implementation of green building in the residential sector.	1	2	3	4	5
The initial cost of green building is offset by the low operating cost which is realized by calculating the lifecycle cost and the payback period	1	2	3	4	5

2. Cost of Green Building

Kindly answer the following question with a Yes or No

Questions	YES	NO
Do you have experience in green building? (If Yes, please answer the questions below. If No, proceed to B3)		
Are initial costs of green buildings higher than conventional buildings?		
Are operational costs of green buildings lower than conventional buildings?		
Are the total costs of green buildings higher than the costs of conventional buildings?		
Do green building features have an impact on the market value of a property?		
Do Property Valuers play a key role in promoting green building in the residential property sector?		

B3. Important Factors for Green Building Valuation

Rate the importance of each of the following factors on a 5-point scale, 1 is not important (NI), 2 is fairly important (FI), 3 is important (I), 4 is very important (VI) and 5 is extremely important (EI)

B4. Barriers to Green Building in the Residential Property Sector
Rank the most common barriers slowing down the progress of green building in the residential property sector from 1 to 5, where 1 is the most common and 5 is the least common.

B5. The Challenges Associated with Valuation of green residential buildings
Rank the most common challenges valuers face when valuing green residential buildings from 1 to 4, where 1 is the most common and 4 is the least common.

Any comments?

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Thank you for your participation!

AN EVALUATION OF SPACE UTILISATION IN INSTITUTIONS OF HIGHER LEARNING: A STUDY OF BUILDING 248 LECTURE ROOMS, UNIVERSITY OF BOTSWANA

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Abstract

To meet the growing demands for space overtime, it is best to ensure that the available spaces are utilised efficiently. The study attempted to provide a thorough evaluation of the level of utilisation of lecture rooms in Building 248 of the University of Botswana. This was done by providing a comparison between the scheduled use of lecture rooms against the actual use of the rooms as well as availability against usability. The objectives of this study were; to determine the utilisation rate of lecture rooms in building 248, to assess the factors which affect utilisation rate of lecture rooms in building 248 and lastly to provide guidelines on improving utilisation of lecture rooms in building 248. Data was collected through the use of questionnaires which were administered to building occupants (students, lecturers and facility managers) of building 248. This is a case study design which utilised a quantitative approach to establish the vast knowledge regarding the utilisation of space in Building 248 Lecture Rooms. This included empirical data from the room scheduling office which provided information on the utilisation rate of lecture rooms. The findings reveal that the lecture room spaces in building 248 were underutilized as they were below the acceptable benchmark of 75% for all spaces used for educational purposes. The findings revealed that factors such as criteria used by university to allocate lecture rooms, room scheduling policy and traditional mode of learning have the potential to affect the utilisation rate of lecture rooms to some extent. The researcher also found out that there is no significant difference between the

scheduled use and the actual use of the lecture room spaces in Building 248. However, there was a significant difference between scheduled, actual capacity/available lecture room utilisation. There should be an implementation of a space management system to help manage the lecture room spaces in Building 248. In addition, there should be in place a room allocation and utilisation policy to govern how rooms are utilized and also to set standards and regulations on the criteria to adopt when allocating rooms for use in the University. This study might be beneficial to professionals and stakeholders such as Facility Managers, Valuers, Architects and most importantly the Room Scheduling Office in the University as this study raises awareness on the importance of incorporating space efficiency in a building and the utilisation of the available space. The implication of the significant difference between scheduled, and actual available space is that the lecture rooms are under utilised in as far as space allocation and utilisation is concerned. In addition, these results might help the university management on the possibility of increasing overall enrolment rate of students as there is enough available space to accommodate more students than what the rooms are accommodating at the moment. There has never been a study like this particular one in Botswana and could be considered as a contribution to the body of knowledge for facilities management in the context of Botswana.

Keywords: Space efficiency, space utilisation, instructional space, utilisation rate

1.0 Introduction And Background of The Study

Space is a very important resource in university buildings (Abdullah, et al., 2012). Effective and efficient use of space helps release funds for other important activities (Adler , 2007) and can help the university generate more funds by enrolling more students. Rowan University explains that if there is shortage of space, tertiary institutions are forced to construct more buildings to increase the available space (Rowan University, 2012). This, therefore, puts immense pressure on tertiary institutions to utilize the available space properly whilst ensuring that building occupants' work and comfort are not compromised (Monahan, 2002). Space efficiency has to be taken into consideration from the design stage and also when buildings are completed (Boston Consultation Group, 2010; Emamgholi, 2011). Space efficiency is a concept that relates to practices that are concerned with saving space (Ballast, 2013). This refers to the various techniques which will result in the gross area of a building

being increased so that there may be more uses and functions being conducted from the space. This space management technique dates as far back as 1900, for as long as real estate existed; the efficiency of that particular building could then be measured and even increased (Ransley & Ingram, 2012).

According to Ransley & Ingram (2012) and Hauke , et al., (2016) the efficiency of space is not only as a result of cost saving but it is also an attempt towards sustainability. Not only does it concern itself with saving costs of having to provide more buildings to meet the growing demand of building users but rather to save the available land area and not depleting it. Various researchers and authors use the term space efficiency as a concept that is concerned with the ratio between gross area and usable area. However utilisation as a space management practice is both space efficient and cost saving in the long run. It is one aspect of space efficiency and has proven to be very vital in the evaluation of the performance of buildings across all sectors.

Space efficiency is a concept that is common in the field of architecture (Harrison & Hutton, 2013). In modern architecture one would find that its techniques seem to be a bit more technical including practices that relate directly to the design of the architecture however traditionally it included mere practices such as foldable furniture, developing multiple uses for a particular space area as well as the use of thin layers of material to make walls which does not necessarily take up much space in the room (Ransley & Ingram, 2012). It is important to note that space efficiency as a concept is widely recognized on a global scale, wherever there is any form of real estate which involves construction of buildings. Space efficiency is supposed to be incorporated from the point of inception in order to avoid complications at a later stage (Hauke , et al., 2016). Places such as the United States of America, Europe and Asia need to continually provide space for the increasing numbers of users and also to cater for the increasing demands of the users.

In Africa the same principle applies, the rationale of space efficiency is to conserve space and derive more uses from a given area of space without actually increasing the land area being used up by the buildings. The idea behind efficiency is to increase usable area in buildings. As a result, businesses and homeowners have learnt that rooms can be designed to achieve certain performance results and even increase productivity in a room. Basically how we build our future workspaces will increase innovation in the same space. According to Harrison and Hutton (2013) the best way to manage cost per square foot is to remove unutilized area. This is evident as we see countries in Africa adopting ideas of building flats to accommodate a

greater number of people and building high rise office buildings to preserve the remaining land area for future parking spot.

s. It is also evident that space utilisation is applied in many functional different properties.
In the Kenya, space efficiency is incorporated in Health Care facilities whereby the Kathera Health Centre maximizes the health service output of the nurses and the health center spaces it uses (Kirigia, 2015). In this case the number of children who are to be attended to on a daily basis will be the input of fixed quantity; the other input quantity which is a variable will be the number of nurses. The output will then be the number of children who were successfully treated however this is dependent on the number of nurses, and this variable is dependent on how the space which accommodates the nurses, if it large then there will be a greater number of nurses to attend to the children and the opposite and is also true. This goes to show that space efficiency is not only used to increase performance in income generating real estate, but instead it can be used to enhance the performance of any buildings.

Narrowing it down to Botswana, it is still evident that space efficiency is widely practiced and it reflects as most recently the architects in Botswana tend to design high rise buildings especially in commercial areas such as in the Central Business District. The developers together with the planners incorporate this concept in the production of real estate stock to cater for the increasing population in cities. The idea of densification in cities has taken effect recently as more agricultural land was being used up to accommodate most Batswana. When the densification occurs, developers encourage the citizens to invest in homeownership instead of landownership through the provision of sectional titles, development of flats and, initiates such as making single-family homes into community homes in the form of multi-residential property, emergence of apartments and duplexes to house families and many more (Burgess & Jenks, 2002). The same is applicable in office parks and commercial spaces where there are more people sharing a particular space which has been partitioned and subdivided into cubicles to serve as a workstation for employees.

There are many studies that have been conducted by different authors on space efficiency. For example, SEV and Ozgen (2009) studied the space efficiency in high-rise office buildings in Turkey. Generally, high rise office buildings are developed to accommodate the increasing population and rapid urbanization. The purpose of the study was to provide a thorough assessment as to how cost and benefit relate to one another in relation to space efficiency of a building. The researcher found out that in Turkey alone from the case studies, they gave an average of about 68.55% in space efficiency and in other parts of the world the level of space

efficiency was about 69.5 % which was an acceptable percentage on a scale of 1-100%. These were acceptable results as an efficiency level of 70% is adopted as a benchmark across the world for office spaces.

Elnimeiri and Kim (2004) conducted a study which was focused on understanding space issues that are caused by stacked functions in multi-use tall buildings. The study showed that there is indeed a relationship between the level of space efficiency and the property's gross area. The greater the gross and rentable area, the higher the efficiency and the less gross and rentable area, the lower the efficiency.

Monahan (2002) and Emamgholi (2011) studied how building design affects space utilisation of buildings. The conclusion drawn from these studies is that properly designed buildings result in efficient utilisation of space. Adler (2007) looked at how efficient space plans can improve the performance of both human and natural resources. He believes that an efficient space is capable of optimizing paths of travel. The researcher found out that once space efficiency is introduced into the mix, this could possibly reduce the staff's footsteps by a 40-50% which ultimately improves the staff performance as well as patient satisfaction and service quality

Ballast (2013) conducted a study on whether efficiency factors are dependent on the type of occupancy and how well the space is planned. He puts forth his argument that efficiency factors often range from 0.60 to 0.80 while some buildings can have efficiency factors outside this range. He found out that it is common for office and retail spaces to have approximately 0.70-0.80 leaving about 20%-30% of the net area as a non-usable area.

Rambarger and Vitullo (2003) discussed core elements of a building and their impact on the efficiency levels of the building. The researchers found out that by rearranging the core elements of the building, the likelihood would be an increase in space efficiency for the user. Phillips and Griebel (2003) conducted a different based solely on the circulation area of a building. The researchers found out that the space could be utilized to increase the net floor area resulting in an increased level of space efficiency.

Ransley and Ingram (2012) conducted a study on the impact of floor slab and shape had on the level of efficiency in high rise buildings. They found out that the initial design of the building will be the determinant of how the available space in a building can be increased at a later period. The right use of a particular space in layout terms will mean that chances are the design process will fall in line easily.

Isaac, et al., (2010) discussed the concept of space efficiency in open plan offices. His findings included open-plan offices reduce the space used up by internal divisions and in that respect, they have proven to be a bit more space efficient than cellular arrangements. Most of the space is taken up by partitioning walls which are often very thick; however with the thin material which is often used to divide the space to cater for open plan offices, it will take up less place thus increasing the level of efficiency in that building.

Douglas (2006) conducted a study on reusing space and adapting existing spaces to new uses. The researcher used a field survey together with the interview method to collect data. The findings included the fact that the aspect of adaptation will only be possible if the space is versatile enough to adapt to the new uses. Here the spaces in the building will have to adapt to the new uses without actually having to change the design of the building. The pressure for

Table 1: Summary of related studies

Theme	Author	Measurement	Methodology
Space efficiency in buidings	(SEV & Ozgen, 2009; University Of Connecticut, 2016; Elnimeiri & Kim, 2004)	How performance of the building affects returns	Field survey questionnaire
Role of conceptual design in high rise buildings	(University Of Connecticut, 2016)	Extent to which attributes of a building contribute to success of real estate	Field survey questionnaire
Design guidelines of space management standards	(Rowan University, 2012; University Of Connecticut, 2016)	the performance of the building, how building design affects performance	Used a case study Literature review
Flexible spaces in architecture	(Monahan, 2002; Emamgholi, 2011; Rambarger & Vitullo, 2003)	How elements of the interior spaces affect flexibility of the buildings	Field survey -Walk throughs investigation and questionnaire, Interviews
Interior design reference manual	(Ballast, 2013)	Factors which affect utilisation of space	Literature review
Building adaptation	(Douglas , 2006)	How flexibility affects performance of the building	Field survey-questionnaire
Property deveopment: appraisal and finance	(Isaac, et al., 2010)	The level of efficiency	Field survey-questionnaire
Building type basics for justice facilities	(Phillips & Griebel, 2003)	The level of efficiency in the buildings	Field survey - interviews
Developing hospitality properties	(Ransley & Ingram, 2012)	The performance of the building	Literature review

Source: Field survey

more adaptation of existing buildings will probably increase in developments that are more efficient and sustainable. Table 1 is the summary related studies that were used in this study based on the methodology used and what was measured.

It can be noted from the studies that there to be more constraints operating over an existing property than with constructing a new building. The aspect of adaptability comes into play here where there will be a need for the existing space to be versatile in order to accommodate the growing demands of the users without actually having to provide new developments. There is a common factor among all the journals in that most of the researchers were focused on the investigation of space efficiency by evaluating the performance of buildings using the qualities of its structural design. The researchers however tend to neglect the utilisation aspect of space management when evaluating the space efficiency of various buildings hence the need for this study.

Ideally, in order to meet the growing demands and need for space by the building users in higher learning institutions; there are certain measures and practices which are supposed to be implemented in a building to ensure that the interior space within that building is being used efficiently. This basically means that the existing buildings should allow room for measures or practices which free up available space to increase the overall usable area in that building. There is however instances where maximum utilisation could be attained from the available spaces without actually having to change the building design but nonetheless increasing the efficiency of that particular space. Utilisation as a space management initiative is often used in an attempt to solve issues relating to need for space.

In real terms, one would find that over time due to the increasing demands for space by building users, there comes a time where a need for more space to accommodate those needs arises. More often than not, this would trigger the provision for new stock of buildings to keep up with the growing demands as well as changes in the interests of the users regarding the use of space. The sad reality is that what may seem as the perfect solution in the form of new construction and extension of buildings to increase performance of the building is in actual fact using up and depleting the available land area which could have been preserved for future use for sustainability's sake.

Continuing with the practice above would eventually mean that more land area is being used up unnecessarily through the provision of new developments and construction of buildings. This takes away the concept of sustainability of the land as it unnecessarily depletes the land area in an attempt to cater to the space needs and demands of the building users. Secondly,

these constructions come at a very high cost as they involve starting from scratch; involving a team of professionals to design, develop and also manage the new construction and it would be very expensive to provide more space this way as opposed to increasing the interior usable space in the already existing buildings. The study, therefore, seeks to evaluate efficient space utilisation in institutions of higher learning to provide the best educational experiences to the building users whilst avoiding the provision of new construction in the pre-Covid -19 era. The general objectives of the study are therefore:

1. To determine the utilisation rate of lecture rooms in building 248 using scheduled, actual and available space/capacity.
2. To assess the factors which affect utilisation rate of lecture rooms in building 248
3. To provide guidelines on improving utilisation of lecture rooms in building 248

To test the three objectives given above, the following hypotheses and propositions were formulated to resolve the objectives.

Null Hypothesis H0 for objective 1: The utilisation rate of lecture rooms in building 248 is under utilised.

Alternative Hypothesis H1 for objective 1: The utilisation rate of lecture rooms in building 248 is well utilised.

Null Hypothesis H0 For objective 1: There is no significant difference between the Actual utilisation of the rooms and the scheduled utilisation.

Alternative Hypothesis H1 objective 1: There is a significant difference between the Actual utilisation of the rooms and the scheduled utilisation.

Null Hypothesis $H0_2$ for objective 2: Respondents does not agree with most of the factors which affect the utilisation rate of lecture rooms.

Alternative Hypothesis H_2 for objective 2: Respondents agree with most of the factors which affect the utilisation rate of lecture rooms.

Null Hypothesis $H0_3$ for objective 3: There are no multiple practices which can improve utilisation of lecture rooms in building 248.

Alternative Hypothesis H_3 for objective 3: There are multiple practices which can improve utilisation of lecture rooms in building 248.

This study can serve as a guide on how space utilisation can be improved in higher learning institutions in the case of University of Botswana. The study area owns more than 40 Buildings each comprising more 10 Lecture Rooms in the Gaborone Main Campus and has a student population about 17,000. These Lecturer rooms are utilised for face to face learning during the two semesters of an academic year which starts at the beginning of August and end in May of the following year. This study looked at the space utilisation rate for lecture rooms for one building being Building 248 which is home to the Faculty of Engineering and Technology. It has 10 lectures on the ground floor and offices for the five departments on first and second floors. There are also about three to five computer laboratories at the second floor with two conference rooms. The three variables were used to measure space utilisation which are scheduled time, actual time used and available time of the space. It was established that the space in Building 248 is under utilised using scheduled time against available space over time. In addition, it is of great importance to room scheduling and timetabling officers as it may help their professional capacity going forward based on the metrics that are used in measuring space utilisation by the University of Connecticut and TEFMA (Tertiary Education Facilities Management Association). Not only does the study add to the vast knowledge on space efficiency in institutional spaces but also helps to assess and evaluate the efficiency of real estate and in extension the sustainability of a property.

2.0 Literature Review

The review of related literature is arranged into four themes. Theme one discusses the general principles of utilisation and how utilisation rate is measured in classrooms. Theme two looks at the general perceptions of facility managers and maintenance personnel on utilisation rate of buildings in higher learning institutions. Theme three explains the factors that affect utilisation rates of buildings. Lastly theme four explains the various models and strategies that have been recommended to improve utilisation of space in learning institutions.

2.1 General Principles of Space Utilisation

According to The Council of Educational Facility Planners (CEFPI), as cited by (University Of Connecticut, 2016) utilisation of classrooms is defined by the student station size, room use in terms of hours, and station/seat occupancy rate. University classrooms include general

purpose/traditional classrooms, lecture halls, seminar rooms, and auditoria. In the calculation of space utilisation, classroom space is defined as the square footage within the walls including the seating area, the circulation space, and any instructor/demonstration area. The storage/service area associated with the room is calculated separate.

According to Rayfield (1997) space utilisation is a measure of whether space is being used as well as how the space is being used. It refers to the efficiency of the design and density of the planning concept. It can at times reflect the quantity of people that can be accommodated in that particular space. Utilisation is a space management technique which can be used to measure the level of space efficiency of a particular space in a building or in most the entire building. Generally space efficiency is described as the ratio between usable area of a building and gross area of that building (Kim, 2004) from the design point of view. This way of calculating the level of space efficiency often makes use of the building's approved plans to deduce such a ratio, then can one go on to determine whether or not the building is performing and whether or not there is a need to promote the level of space efficiency of the building. On the same note, it is important to highlight that although utilisation is a space management technique, it is also a space efficient technique which can be used to increase the efficiency of a building. However this study evaluated the space efficiency of buildings from a utilisation point of view. That is the researchers evaluated the utilisation rate of a building to determine whether or not a particular building is space efficient or not.

Different authors (Watch, 2002; Smith, 2011; Hay & Beveridge, 1999) offer different methods of deducing the utilisation rate of a building. According to Watch (2002) there are several prototypes which are often used as a guide to deduce the utilisation rate of a building; however in real terms, ideally the number of students that a room can accommodate is a crucial factor in determining how efficient a classroom space can be used. In cases where one needs to determine the number of classrooms required, the researcher is obligated to observe and evaluate the class schedules.

According to Watch (2002) it is very important to evaluate the entire campus scheduling of classrooms in order to maximise efficiency. This author uses the number of students that a classroom can accommodate as a critical factor in determining the efficiency in which a classroom can be used. His methods are not so different from those of Smith (2011) as he too uses net square feet per seat and the average number of seat per classroom. Both authors agree that indeed the size of a space will affect its utilisation rate however differs with the rest of the authors as he strongly believes that the location of a particular space in a building will

affect its utilisation as well. According to deciding whether a lecture room is too big or small is the easiest part, the hardest would be determining whether its location is right or wrong.

Hay and Beveridge (1999) use room frequency factor (RFF) as part of the terminology to describe the utilisation of lecture rooms. This method is different from the other methods as unlike other authors who use the amount or number of people a room has nor the holding capacity of the particular room, this one makes use of information relating to the hours in total in which the room is in use or used against the number of hours the room is actually available for use either on a daily, weekly or even monthly basis. Hay & Beveridge argue that the above coupled with a room's scheduled timetable will yield what is known as the room analysis program which shows all the relevant information about the room and how it is scheduled use through the semester/ term. The task would then be to determine whether what has been panned reflect to what is actually being practiced in terms of use hence the variations in the utilisation rates of spaces in a building.

According University of Buffalo (2017); Fink (2002) and Ibrahim, et al., (2012) by prioritizing the utilisation of fixed-cost resources (space) over the efficient allocation of variable-cost resources (part-time faculty) is a very ineffective strategy. Current space assignments may need to change, and when new buildings are completed, space allocation in new buildings and the free space in existing buildings should be allocated in accordance with the institutional goals and objectives and to address critical space shortages.

University of Buffalo (2017) in contrast to the other authors provided an observation explaining how challenging planning of instructional facilities and their utilisation actually is. Administrative staff found that there are indeed enough classrooms, based on the principle that they can achieve maximum utilisation over the course of a working day and on all school days, “We can place the requested course sections in our available space. It has been noted, however, that the university does not have enough space in the classroom to properly plan the courses that can be offered to students”. The mixed approach to classroom management is compounded by the fact that most universities lack a comprehensive understanding of their entire teaching inventory and both current and historical use of the entire inventory.

2.1.1 Measuring utilisation of classrooms and lecturer rooms

There is a significant difference between classroom use and classroom utilisation (Fink, 2002; Elnimeiri & Kim, 2004; Ibrahim, et al., 2012). Although classroom use simply mean that a room is occupied, utilisation will provide a measurement of the amount of area occupied in

computing room frequency, room occupancy and utilisation

Figure 2 shows the *space utilisation rate formula* provided adopted by (Abdullah, et al., 2012) and (Ibrahim, et al., 2012) to determine the utilisation rate of the space in lecture rooms and classrooms. The findings were different, however the principles applied were the same, especially when using a benchmark, one would find that Frowd (2005) offers a different approach on how utilisation rate of lecture rooms in institutes of higher learning could be measured. He suggests the use of both standards set by the institution on space and room utilisation together with the use of benchmarks to use as a guide. According to Frowd (2005), standards are a bottom-up approach and they define the area required to perform a particular function or activity. These standards are based on functional requirements for specific activities and are well established through the prioritization and design process. Benchmarks, on the other hand are a top-down approach and are used to gain better understanding of space usage. They are often used extensively for comparison purposes. It is important to note that space cannot be managed from the top down as standards are set below and reflected as outcomes at the top.

In another study, Frowd (2009) takes a different point of view in addition to his first recommendations on the approaches to apply when measuring the rate of use of a room. He advocates the idea that room audits are an integral part of measuring space utilisation rates. Room auditing is a process that involves counting the number of students using the various teaching facilities within a university. For this purpose, all campus operating hours are recorded for one week per semester and the data collected through room audits is combined as room frequency and room occupancy. The use of room audits indicates the actual use of an institutions' facilities and as such should be used in conjunction with room reservations and class registrations.

Cornell University (2017) used a rather different approach to measure the utilisation rate of lecture room in universities. In addition to occupancy and frequency of rooms, they take it a step further and use the 'seat fill" approach to measure utilisation of space in lecture rooms. This approach is used to measure the variable of seat utilisation which is not very common and therefore not many authors and researcher even consider this approach. Seat fill measures the seats occupied for each time a room is in use. This variable measures the correlation between class size and room size. This is also known as the station occupancy rate, which differs from the occupancy of a room as it is the area that a student seat occupies and can therefore be calculated for a class or even a set of classrooms.

The formula is as follows;
*Seat Fill (%) = Total Number of Students, Weekly/ (Stations x Hours of Use, Weekly) * 100*

The university set an expectation and a benchmark that the seat occupancy for a room, will be between 60-75%. This is ideal as those between 90-100% will feel crowded. Even though maximum space utilisation is key, there should still be room for students to navigate to seats.
Abolhassan (2014) provides a very different approach on how they measure space utilisation and it is in contrast to the approaches of the previous authors. The space manager of the institution asserts that conducting an annual Space Audit by having departmental heads provide verification of space assigned to it and its current use will assist in measuring the utilisation of space in lecture and class rooms. Reports on compliances as expected together with variations that occurred in the process if there are any; were compiled and this allowed the space and facility managers of the buildings to come up with ways of increasing the utilisation rate if at all the reports indicated a need for utilisation of the spaces to be increased. The combination of the annual space audit and the Facilities Services project database allow the space manager to keep CAD floor plans and the space management software so that the graphical reports of space remain accurate.

2.2 Perceptions on Utilisation Rate of Buildings in Higher Learning Institutions

In order to find the optimal utilisation rate there should be a robust and disciplined process of accurately assessing available spaces.

According to Fink (2002) classrooms are at the lower end of the campus hierarchy of space usage in terms of campus square footage. Offices are usually at the top of the list. The core function of a university is teaching and imparting knowledge. Therefore, classrooms and lecture rooms facilitate learning and should be considered first when assessing space utilisation. In looking to other campus spaces, classrooms and lecture rooms are still considered last regardless of whether or not the space is being used well or whether or not campus space use is changing.

According to Abolhassan (2014) it is very crucial to note that an ideal utilisation of any space would turn out to be different for every case and that trying to impose uniformity or uniform standards would lead to wrong, inconclusive and ambiguous results. Various authors have managed to provide different benchmarks to determine whether the utilisation of any given space is high, acceptable or low. There are numerous ways, formulas and algorithms that are used to determine the utilisation rate of a particular space of which have been discussed. However, regardless of the formula used, there are set benchmarks which serve as a guide to

indicate whether or not we are on the right path in terms of utilisation as well as the current use of a space in a building.

Hall (2013) suggests using a benchmark of 70% for spaces which long-term improvement potential. This reference value will be applied in cases where 75% of the usable area is currently used. According to Sweeney (2013), companies have a utilisation rate of 50 to 75% in most cases. Sweeney (2013) suggests that these building owners suffer a greatly because they pay 25-50% more for unused space. This dynamic has led many real estate managers and tenants to address space utilisation from an “as-needed" basis. “The biggest challenge is determining the actual usage of individual rooms and spaces”.

According to Davis (1996) it is very important to analyse the performance of a building. He insists that the anlysis of such will involve obtaining primary data from building users. Doing so would entail the use of questionairs as well as interviews to assess the different user's perceptions, their attitudes together with their level of satisfaction with the building. The author also adds that such an analysis would require researchers to evaluate feedback about utilisation of a particular building by posing questions towards administrative personnel, the staff, faculties, students and in some cases even the support personnel which include the likes of technicians and the maintenance crew of that partcular building.

Davis (1996) affirms that the analysis of user satisfaction in particular tends to focus on major interior as well as exterior spaces and addresses issues such as satisfaction and perception of the building use as well as the environmental impact of the building, the image of the building, the scale, materials used and form, the safety of both the person and that of the property itself and finally the way in which the building users communicate and interact with one another.

In addition to the user satisfaction analysis, Davis (1996) and (Anon (n.d.) suggest an analysis on the building performance. The analysis is different from that of the user satisfaction as it involves the use of observational techniques as well as the instrumentation to evaluate building performance. It was concluded that the way in which the building responds to the different demands made on it will also have an effect on its performance.

There is however another author who brings forth a different approach on how to conduct an analysis regarding the utilisation of a building. According to Finch (2011) observational analysis and behavioral mapping can also be used to assess space utilisation. This approach will make use of an analysis on the level of utilisation, the efficiency of use, variations

between the activities conducted within a certain space and its physical setting.

Preiser and Vischer (2006) also put forth another different approach to determining the perceptions of the building users. The researcher provides two basic assumptions for a proper analysis; the first being the use of post occupancy evaluation as a way of evaluating the feedback from the building users and secondly their experiences within the building; that is to say that individuals often convey different meanings to the different experiences in different places within the building. This as result will influence the kind of feedback and perceptions they may have regarding the utilisations of the spaces within the building. In essence, Preiser and Vischer (2006) recommend the use of post occupancy evaluation to determine the perception of the users of any building in order to derive any form of feedback regarding the utilisation of that particular building.

TABLE 2: Room utilisation rate

Room type	Weekly room usage	Station utilisation	Station size
Classrooms	35	70%	18-30 square feet
Lecture rooms	35	75%	16-22 square feet
Auditorium	35	75%	12-20 square feet
Collaborative/seminar	35	70%	25-30 square feet

Source: 'Space Planning Guidelines for institutions of higher learning' published in 2006 by the Council of Educational Facility Planners International (CEFPI)

According to University Of Connecticut (2016), Table 2 was provided by the Council of Educational Facility Planners International as a guide for architects to consider the geometry of the room, more especially since the shape can also affect the capacity of the room resulting in space inefficiency.

n contrast, Frowd (2009) provided a table which shows what he termed an “indicative 'good

TABLE 3: Room target utilisation rate

Space type	Target Room Frequency	Target Room Frequency	Target utilisation
Lecture theatres • Large (250+250 seats) • Medium (180-250 seats) • Small (60-179)	75%	75%	56%
Teaching • Large flat floor teaching areas (non-theatre) • Classrooms • Tutorial rooms	75%	75%	56%

Computer Laboratories[3]	75%	75%	56%
Laboratories[4]	50%	75%	37.5%
Workshops[4]	50%	75%	37.5%
• Engineering, metalwork, woodwork, psychology, children's studies			
Studios	75%	75%	56%
• Architecture, painting & drawing, sculpture, ceramics, textiles, printmaking, dancing, drama			
Practice rooms	80%	75%	60%
• Dance and music			
• music			
Meeting rooms[5]	45%	75%	34%

Source: University Of Connecticut (2016)

practice' space utilisation rate". Although the table may be similar in some aspects to that of University Of Connecticut (2016), Frowd (2009) took it a step further by providing the expected utilisation rates of other rooms which are likely to be present in any higher learning institution as per the guidelines of the TEMFA benchmarking guidelines. The details are presented in Table 3.

he space utilisation rates shown above are only and indication and were based on a typical total week of 67.5 hours. This basically means although some authors opt to calculate the utilisation rate of a lecture room on a daily basis (University Of Connecticut, 2016; Frowd, 2009) chose to calculate it on a weekly basis. This was probably to allow for discrepancies during the week (or days of the week) such as when there were fire drills in the building which fortunately do not take place every week of the month, they happen sparingly.

2.2.1 Criticism of the perceptions of authors

The literature which was reviewed had a similarity across all the authors such that their researches did not take into consideration the likely effect that part time students would bear on the results. They confined their studies to students, who were enrolled on a full time basis, and this brings into play questions of whether or not there were part time students who were deliberately left out for reasons unknown or the population of the study did not have part time students at all. Nonetheless, including part time students would have provided variability in the results of the utilisation rate of spaces used by full time students and that used by part time students and comparison could be drawn from the two different groups of students. The other factor critic is that the authors provide the numerous arguments on ways in which the rate of utilisation of space may be deduced however they fail to provide which one of the numerous methods is the most successful, nor do they highlight which one they recommend would yield the most valid and significant results.

2.3 Factors Affecting Space Utilisation Rates In Higher Learning Institutions

The following are factors which different authors provided as those which affect the utilisation rate of lecture rooms and as such can be listed as possible reasons for the utilisation rate of class and lecture rooms in Universities. These include:

2.3.1 Assessment of classroom space and use

According to Smith (2011) the low utilisation rate of a building or a particular space in a building may be due to the fact that it may be badly timetabled, that is to say that it is not scheduled to host classes more often and that would ultimately affect its utilisation rate. Smith (2011) provides the 'frequency variable' as the reason behind a buildings utilisation rate. Both Watch (2002) and Smith (2011) on the other hand, do agree that the reason behind the utilisation of any building either high or low is mainly due to the occupancy variable, that is whether the space is being used to its full potential by looking at the current number it accommodates against the total or maximum number is ideally supposed to accommodate.

According to Hay and Beveridge (1999) the reason behind a low utilisation rate of the lecture rooms directly relates to the fact that there what the author calls a wastage of lecture rooms. This is mainly due to the fact that the lecture rooms are embedded in the individual science buildings and are used solely for specialized department. This alone means that there is an element of restricted use of the rooms therefore the wastage of idle rooms not being used nor scheduled for use in the departmental timetable would ultimately result in a low occupancy. In a nutshell both Smith (2011) and Hay and Beveridge (1999) give lack of occupancy and wastage of a space in a building as variables which are part of the reason behind a building's inefficiency.

Space Management Group (2006) does not differ so much from other authors as they too list the above variables as part of the reasons which affect the utilisation rate of any given space. Space Management Group (2006) put forth their an additional argument that part of the reason behind such low utilisation figures was mainly because average room sizes were often greater than average class sizes. This does not mean that it disregard the views of the other authors, it only reinforces their argument and provides a different perspective on the reasons behind the utilisation of any space; either high or low.

2.3.2 Classroom scheduling

Fink (2002) declares classroom scheduling as one of the variables which affect the utilisation rate of classroom. “The process of distributing classrooms for use in the next semester based on their distribution and use in a previous semester”. Although there are computer algorithm programs help campuses in allocate space, there are however those rare cases where this is done manually. When the system is used appropriately, then the likelihood will be an increased utilisation rate and the rooms will be used when they are scheduled to be used, however in the event that the rooms are scheduled manually, and records of such a scheduling cannot be found, then rooms may not be utilized accordingly resulting in a decline in the utilisation rate for an extended period of time until a corrective measure is implemented.

Space Management Group (2006), Fink (2002) and University of Connecticut (2016) are all in agreement to a certain extent. They share the same view that classroom scheduling is a step in the right direction towards increasing the utilisation of lecture rooms as well classrooms. A department checks its classroom schedules from the previous semester against upcoming courses and notifies the registrar of any changes. Then, the maximum number of students to be accommodated in each course / program is determined, along with the preferred time slots of the day, the most suitable type of room according to the size / capacity of the class. The schedule is only revised if user needs change.

2.3.3 Policies on room scheduling and utilisation

Fink (2002) implies that having many universities without spatial planning guidelines is not an anomaly for planning efficiencies, in fact (Anon., n.d.). Mentions that there are no committees set in institutions for overseeing scheduling efficiencies. There are very limited activities in relation to the application of the beginning and the end of the lessons”. This is common in universities when students postpone classes without the knowledge of the managing authority. “Lack of guidelines and inherent difficulties in classroom planning can lead to inefficient use of the classroom. It goes without saying that the application and even the existence of such guidelines would increase the occupancy of classrooms and lecture rooms to some extent.

2.3.4 Flexibility

According to Frowd (2009) the more students are enrolled in a course, the more difficult it is to create schedules or offer a wider range of subjects or combinations of modules each

semester, the more difficult it becomes to produce timetables and this alone may be the reason for decreased rates of utilisation. The diversity of courses which brings about the flexibility element would mean that students attend various classes across the campus using different rooms each time leaving some rooms permanently unused or underutilized. Edwards (2009) on the other hand puts forth a conflicting view as he reveals that flexibility may not necessarily be a negative factor in utilisation. He approaches this aspect from a perspective where flexibility applies to the use of space.

2.3.5 Teaching patterns

This factor is particularly in specific reference to courses or programmes which involve a lot of practical work. Teaching patterns vary according to the institution and it most definitely has an impact on the overall utilisation of space. Programmes which require students to be away on field work most of the time and include the likes of nursing and teaching would mean that lecture rooms are used sparingly; they are used actively during periods when there is less practical work and used the least when students are away on industrial training which will result in the variability between low and high utilisation rates accordingly.

2.3.6 Part time staff and / students

According to Charles Darwin University (2014) and Frowd (2009) part-time and sessional staff are not available to teach programs at any time during the institution's operating hours. This reduces the freedom to schedule lessons and can lead to less use of classrooms. However Bullock , et al., (2008) put forth an opposing view as they affirms that a mix of fulltime and part-time students and staff can achieve higher overall utilisation rates on average as compared to institutions with students primarily in one mode. This pattern is common among institutions including those with high levels of room utilisation. In a nutshell, based on the arguments above, institution with a tradition of teaching smaller classes have the potential to utilize their recurrent teaching resources more efficiently by introducing lecture format units with large enrolments.

2.3.7 Specialized learning spaces

These spaces are built for practical and integrative learning approaches which allow students and staff to work collaboratively. Some highly specialized facilities may not achieve high utilisation rates, but may be necessary to successfully carry out an academic programme. In these instances, utilisation should be looked at in reference to the service provided by the

space. This may be particularly pertinent for spaces that may be in use when the room itself is vacant. (E.g. an unattended research project). This includes spaces such as workstations, workshops and other industrial stations within a building used by students who partake in industrial courses. These rooms are only used if and when the need arises to use those workshops and as such their utilisation rates may be low (RMIT university, 2018)

2.3.8 The gap between predicted and observed use

In most cases, there is a mismatch between how an institution currently conducts its teaching and research activities, and how those activities were originally intended to be conducted, and assumptions about the use of space as originally planned. These changes can be the reason for either low or high utilisation of a particular space in a building. The gap between surveyed levels of utilisation is the gap between predicted and observed utilisation levels, both in terms of frequency and occupancy rates can contribute towards the low rates of utilisation. According to Space Management Group (2006) our perceptions often differ with past experiences, such that one would eventually realize that empirical studies have revealed that utilisation was far lower that than was generally realized even when users felt crowded.

2.3.9 Methods of delivery

This relates to spaces which are based on assumption of how students of different disciplines would be taught, however that type and amount of space may not necessarily be appropriate for new methods of delivery. Frowd (2005) and Space Management Group (2006) both reveal that the new emergence of initiatives such as self-taught programmes and distance learning courses, one would realize that there are fewer or no contact hours of teaching. These will definitely decrease the utilisation rate of a given space. Staff: student ratios need to be observed in order to monitor the utilisation rates of spaces.

2.4 Strategies and Models for Increasing Space Utilisation

As discussed through the study, the utilisation rate of a building or any given area of space can either be low or high due to the various reasons reviewed above from different literature. Numerous authors vary while some agree on the ways in which utilisation of space can be increased in institutions of higher learning across the world, some of strategies and model for increasing space utilisation are discussed below.

2.4.1 Reports

According to Anon (n.d.) as cited by Hall (2013) recommends the use of multi-factorial and

multi-method analysis to identify characteristics of the learning space that improve student learning. He suggest that the efficiency of learning space can increase productivity of both students as well as the teachers and thus emphasizes the need to increase utilisation of space. He recommends a thorough analysis of the characteristics of the space and provision of a proper report which could then be used in future to enhance academic productivity and cost benefits analysis in the long run. Charles Darwin University (2014) puts forth a view which is in agreement with that of Hall; “To improve the use of the university's assets, it is important that faculties, schools, departments and individuals help streamline space management across the campus by reporting on underused/ empty spaces, buildings and facilities”. The use of reports will eventually prove to be useful especially when they are archived as records and benchmarks that can be used at a later stage (Hall, 2013; Charles Darwin University, 2014; Frowd, 2009).

2.4.2 Indicative space model grid

Frowd (2005) provides a contrasting view about how the utilisation of space in higher learning institutions can be increased. He implies and recommends that an “indicative space model grid” which he refers to as a good space management tool could perhaps be implemented. The grid has a variety of uses however the most prominent are that it can be used to project space needs within a building. It not clear as whether this grid is applicable in other building which are not educational institutes however it has proven to work effectively in such conditions. He did however highlight that this grid is very useful in cases where one would need to work out space for new academic schools, department or disciplines.

2.4.3 Space management system

According to Space Management Group (2006); Charles Darwin University (2014) and Frowd (2005) the implementation and use of a space management system can improve utilisation rates. According to Charles Darwin University (2014) this system considers gross floor area of the building; the usable floor area, the equivalent full-time load as well as the actual contact hours. When planned and executed correctly, the system will often include: space inventory, space reporting and space planning.

2.4.4 Space repurposing

Charles Darwin University (2014) and Frowd (2009) agree on the view that repurposing of space could possibly increase the utilisation rate of class and lecture rooms in institutes of

higher learning. In many cases, the allocation and even the reallocation of space will require space to be repurposed, which will then require modifications, some renovations and refurbishments. Nonetheless the project will require significant planning procedures as well as communication which is very key in order to achieve the desired outcome. However, there are some aspects to consider when converting a space such as budget, furniture, project management, fixtures, fittings and aesthetics as well as consideration for environmental management.

3.0 Methodology

A quantitative approach was adopted in order to achieve the objectives of this study. Amaratuga, Baldry, Sarshar, & Newton (2015) mention that the quantitative approach is useful to study a particular phenomenon. It is used to answer questions about relationships within measurable variables with the intention of explaining, predicting and controlling a phenomenon (Creswell, 1994; Burns & Grove, 2003). Therefore, this approach will be helpful in better understanding the use of space in building 248 using the metrics that have been appreciated in the literature review section.

The researcher obtained a sampling frame which would indicate all the students and lecturers as potential respondents. A sampling frame is a list of all the people forming a population from which a sample will be derived (Leedy & Omrod, 2001). The researcher divided the sampling frame into a list of lecturers and that of students who were scheduled to use building 248 and then sample each category to determine the sample size under each.

A list was acquired from the room scheduling office which contained information on all the classes scheduled to attend in building 248 together with the estimated numbers of the students. This list may not be very accurate as there are instances where people are scheduled to use a room, and they decide not to but unfortunately, the scheduling office is hardly ever notified of this change. Therefore the records will forever be inconsistent and false unless the opposite is done. With that being said, a rough estimate of the number of users of building 248 was made and from that a sample frame was devised.
The researcher made a delimitation not to include the rest of the working staff currently employed under the FET which includes the security officers as well as the cleaning staff as they are not directly affected by the core business of the faculty and thus they would not be able to provide the researcher with relevant information for the study. This basically means

that in addition to the students, the academic staff were included as building users, of which for each class scheduled in building 248, the researcher assumed that there was a single lecturer for that class. Lastly the population of the study comprised Facility Managers employed in the University of Botswana. This included both in-house Facility Managers as well out-sourced Facility Managers.

The total population was 3550 people

The two sets of *sample frame* above give each and every student and staff member listed their a chance to participate as potential respondents in the study. However due to the large numbers, there is a need to sample the two groups to have an exact number of respondents who were chosen at random to provide the researcher with data on the research topic.

From the information provided above we derived the sample size using a 90 % confidence level and a 10% margin of error due to constraints of time and money. Below is a formula used to deduce the sample size of the population.

Formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where n= sample size
N=population
e= margin of error

$$\frac{(3550)}{1 + 3550(0.10)^2} = 97.26$$

98 people (sample size)

TABLE 4: Population sampling

Study population	Number	Formula	Sampling
Academic Staff using block 248	111	(118÷3550)*111	4
Students using block 248	3439	(118÷3550)*3439	114
Facility Managers	10		10
Total	3550		128

Source: Field survey

** To cater for the possibility of both non-responses and refusals by the respondents, the researcher provided a 20% contingency in addition to the sample size. This is 20 more people being added to the 98 above giving a total of **118 people** as the sample size **

rate of lecture rooms and laboratories in Building 248. Facility managers and maintenance personnel are responsible for regular maintenance and operation of all elements of the building. Academic staff and students use the lecture rooms and laboratories for learning purposes. The unit of analysis for objective one was lecture rooms. For objective two and three it was lecturers, students and facility managers. Table 9 shows the variables and measurement scales used to measure the variables for each objective.
A five point Likert scale rating system was used to rate the respondents' responses. The Likert scale ranged from strongly disagree to strongly agree. Primary and secondary data sources were used to collect data for this study. Primary data was collected from questionnaires that were administered to the occupants of building 248. Secondary data was collected from published books, journal articles, and conference papers and published dissertations. These secondary sources were obtained through the use of Internet and online databases such as Research Gate, Academia and Emerald-sight. The collected data was then analysed with Microsoft Excel and presented through the use of tables, graphs and charts.

Regarding the university room allocation database, the system was independent from the university's registration system commonly known as ASAS, therefore the researcher had to work with one of the officers responsible for timetabling in the university in order to gather information on the room capacities, the number of hours used in a week and the number of students scheduled to use the room on a daily and weekly basis. The independence of the two systems made it a rather difficult and a very lengthy process when collecting data as both systems had to be consulted in order to calculate the utilisation rate of the lecture rooms. There were instances when assumptions had to be made regarding the room scheduling especially when rooms were allocated to courses which were not offered that semester, or rooms allocated to classes larger than the capacity of the room and even cases where rooms were allocated to classes which were later moved to other buildings without the knowledge of the administration office.

Data collected from the University's room allocation database was analyzed using the above tools so as to provide a thorough analysis of the data. To calculate room utilisation rate, there was a need to determine both room frequency and room occupation. The formulae in Figure 1 was then input into Microsoft Excel to calculate utilisation rate of each lecture room on a weekly basis. The researchers used the formulae in Figure 1 to calculate the utilisation rate of the lecture rooms in Building 248.

4.0 Data Presentation, Analysis and

Interpretation

In this section, the findings from the data that was collected from the distribution of a questionnaire were thoroughly discussed. A presentation of the statistical data followed, through the use of tables and charts where necessary. The findings of the research project were then discussed against the predictions of the likely outcomes of the research (hypotheses) which were stated in the first section of this paper.

4.1 Demographic and General Information

The questionnaire for this study was divided into 3 different groups, although it should be noted that one questionnaire was specifically designed for the lecturers and students and an interview guide for Facility Managers. A total of 118 questionnaires were distributed to the lecturers and students of which 4 of those were lecturers and the remaining 114 were students as per the sampling which was done in section three of the study. All the 4 questionnaires which were administered to the lecturers were all filled and returned back to

TABLE 6: Demographic details of the respondents

Variable			Frequency recorded	Percentage (%)
Gender	Students, Lecturers and Facility Managers	• Male	42	43
		• Female	56	57
Age group	Students, Lecturers and Facility Managers	• 16-21	19	20
		• 22-28	46	47
		• 29-35	14	14
		• 36-42	5	5
		• 43-49	6	6
		• 49+	8	8
Status	Students & Lecturers	• Full-time student	84	95.45
				4.55
		• Full-time lecturer	4	
	Facility Managers	• In-house	8	80
		• Out-sourced	2	20
Year of study	Students	· 1	4	4.76
		· 2	12	14.29
		· 3	28	33.33
		· 4	17	20.24
		· 5	23	27.38

Regarding the following t-tests between the scheduled use of the rooms and the actual use of the rooms were applied. If there is a significant difference between the two groups, the alternative hypothesis is accepted whilst the null hypothesis is rejected. When the difference between the two groups is not significant, that is above 0.05, the null hypothesis is accepted and the alternative is rejected. The researcher used the t critical one tail for analysis of the t-

Table 8: t-test for room 3

	No.of HoursUsed (as scheduled	*No.of HoursUsed (actual)*
Mean	6	4.8
Variance	1	1.7
Observations	5	5
Hypothesized Mean Difference	0	
df	7	
t Stat	1.632993162	
P(T<=t) one-tail	0.073244372	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.146488743	
t Critical two-tail	2.364624252	

tests instead of the probability value.
From the Table 7, it is clear that room 3 is scheduled for use mostly on Mondays and least on Fridays. Out of the 55 hours available in a week, the room is only scheduled for 30 hours while

Table 9: Room 4 weekly schedule

Days	No. of hours used (as scheduled)	No. of hours used (scheduled)	Hours available	Total No. of students	Room capacity
Monday	6	6	11	154	39
Tuesday	8	6	11	23	39
Wednesday	7	5	11	170	39
Thursday	5	7	11	97	39
Friday	5	5	11	128	39
	31	29	55	572	39

Source: Field survey

in actual fact only 24 hours are used in a week.

A t-test was conducted between the scheduled use and actual use of room 3. The results are

while in actual fact only 32 hours are used in a week.
Using the t critical one tail value of 2.02, this is greater than 0.885 and thus the difference

Table 23: room schedule for room 11

Days	No. of hours used (as scheduled)	No. of hours used (scheduled)	Hours available	Total No. of students	Room capacity
Monday	6	6	11	136	106
Tuesday	6	6	11	53	106
Wednesday	3	4	11	154	106
Thursday	4	4	11	135	106
Friday	2	0	11	119	106
	21	20	55	597	106

between the two groups is not significant, we therefore accept the null hypothesis.
From the Table 21 , it is clear that room 10 is scheduled for use mostly on Mondays and Tuesdays and least on Fridays for only 2 out of 11 hours. Out of the 55 hours available in a week, the room is only scheduled for 31 hours while in actual fact only 28 hours are used in a

Table 24: t-test for room 11

t-Test: Two-Sample Assuming Unequal Variances		
	No.of HoursUsed (as scheduled	*No.of HoursUsed (actual)*
Mean	4.2	4
Variance	3.2	6
Observations	5	5
Hypothesized Mean Difference	0	
df	7	
t Stat	0.147441956	
P(T<=t) one-tail	0.443470064	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.886940129	
t Critical two-tail	2.364624252	

week.
The difference between the two groups is not significant as the t critical value of 1.86 is greater than 0.36, therefore we accept the null hypothesis.

were a few of the respondents who agreed with this particular factor to that extent.

The results of Table 29 as per the field survey indicate that the lecturers were neutral about a majority of the factors which affect the utilisation rate, while some strongly agreed with the factors. The extent of disagreeing with the factors was only limited to one factor, while they agreed with the remaining factors, however over all mean score of the results suggests that they agree that the factors affect the utilisation rate of lecture rooms in Building 248.

Table 30 is the ANOVA as per the responses between all response groups, namely the facility managers, the lecturers and students. Using the F-Crit value of 1.26 above in comparison to the computed F (5.47) in TableT0, it can be noted that the F value is greater than the F-crit; therefore we reject the null hypothesis. This shows that there is a significant difference in the scores of the 3 groups. This means that though they agreed that these factors affect space utilisation, there was an element of disagreement in the variables were scored between groups and within groups.

4.4 Findings Addressing Objective 3: Ways of Improving Utilisation Rate of Lecture

Table 31: Guidelines on improving utilisation of lecture room space

Guideline	Ways of improving space utilisation	Respondents' Ranking Score									
gl.1	Provision of detailed reports on current space management procedures	4	3	1	2	4	1	4	1	1	5
gl.2	Indicative space model grid: A model which projects space needs within a building	3	4	2	3	3	2	1	6	6	2
gl.3	Implementing a Space Management System	1	1	3	1	1	3	6	2	2	1
gl.4	Repurposing of space	6	6	5	5	5	6	5	5	5	6
gl.5	Adaptation of existing space to new uses	5	5	6	6	6	4	2	3	3	4
gl.6	Space indicator group: grouping different fields/ disciplines of education and assigning to each group	2	2	4	4	4	2	3	4	4	3

Source: Field survey

Room Space

The following are the various ways in which utilisation of space in any institutional building may be improved. Please rank the following guidelines based on an i*mportance scale* of 1-6, with **1** being the **most important** guideline to ensure an improvement in space utilisation and **6** being the **least important** guideline.

The values above are different scores as assigned by the facility managers in the University of Botswana. There were ten (10) respondents of which each one of them ranked the guidelines accordingly. From the results, it can be concluded that the majority of the respondents suggest that the most important of the guidelines above, is the *implementation of a space*

management system (guideline 3). That is 5/10 of the Facility managers ranked guideline number 3 as the most important from the list of possible guidelines which are likely to increase the utilisation rate of lecture room spaces in building 248. The majority of the respondents as per the results in the table above also ranked *repurposing of space* (guideline 4) as the least important of the guidelines above. Only 40% of the respondents felt this way. Of the 37% of the FM who suggested that there is room for improvement in the utilisation of lecture room space, the majority implied that more often than not, the biggest issues are with regard to scheduling of room use. The cases include multiple scheduling of rooms for a single class session slot, where students find themselves being evicted from a room mainly because the room was originally scheduled for a different class. They suggest that the University room allocation system or database be updated frequently to detect such conflicts in timetabling and scheduling of classroom space.

4.5 Discussion of Findings

In this section, a brief discussion of the findings will be provided as per the objectives of the study.

4.5.1 Utilisation rate of lecture rooms in Building 248

The first objective sought to determine the utilisation rate of lecture rooms in building 248. The data collected revealed that all the lecture rooms in building 248 were under the utilisation rate benchmark of 70% as set by Tertiary Education Facilities Management Association (Frowd, 2009). The utilisation rates of room 3 to room 12 were as follows; 16.31, 26.67, 20.84, 25.70, 21.49, 13.86, 15.96, 20.57, 10.24, 20.08. (All these are in percentages). It can be seen that these rates are nowhere near the benchmarks of 56-75% set for instructional spaces in institutes of higher learning (Frowd, 2009; Hall, 2013; University Of Connecticut, 2016). The data collected from the Room Allocation database can confirm these rates as the calculations were based on the data provided by the database.

4.5.2 Factors which affect the utilisation rate of lecture rooms in Building 248

The second objective sought to assess the factors which affect the utilisation rate of lecture rooms in building 248. The data collected from the student respondents revealed that the respondents agreed with the majority of the factors provided in the questionnaire affect the utilisation of lecture rooms. This was shown by an overall mean score of 2.32; implying that they do indeed agree that the factors affect space utilisation. The responses of the lecturers as per the field survey indicate that the respondents also agree that indeed these factors

affect utilisation of space in Building 248. The respondents agreed as the mean score was 2.15. As for the Facility managers; they seemed to clearly agree that most of the factors above do indeed to affect the utilisation of lecture room space in building 248 however there are a few who were neutral about some of the factors, as they could not decide whether they had the potential to affect the utilisation of space in the building or not. Their overall mean score was 2.06 which fall within 'agree' when using the Likert scale. These revelations were made from calculations of mean scores of the students, lecturers and the Facility mangers.

As per literature all the factors provided in the questionnaire are equally important and are dependent on the priorities of the institution. The factors as listed in the questionnaire depend on the priorities of the institution; if it more concerned with making profit, then space charges as a factor will be assessed as most likely to affect utilisation as opposed to those who consider the student feedback on space use or the University's policy on space utilisation (Charles Darwin University, 2014). The last two are more concerned with service quality and meeting standards set to boost the reputation of the institution.

4.5.3 Guidelines on Improving Utilisation of Lecture Rooms in Building 248

Finally the third objective of the study sought to provide guidelines on improving utilisation of lecture rooms in building 248. The respondents were to rank the guidelines in order of importance from most important to least important, and the survey revealed that the majority of the Facility Managers chose the implementation of a *Space Management System* as the most important followed by the an *Indicative Space Model* which tied with the *space indicator group.* The results revealed that the least important of the guidelines provided in the questionnaire was the guideline which suggested the *repurposing of space* followed by the adaptation of existing spaces to new uses.

According to the literature, Frowd (2009) suggested that an Indicative Space Model was the most important guideline as the grid has a variety of uses however the most prominent are that it can be used to project space needs within a building. It not clear as whether this grid is applicable in other buildings (non-instructional spaces) which are not solely used for educational purposes. However it has proven to work effectively in such conditions. Frowd, (2009) did however highlight that this grid is very useful in cases where one would need to work out space for new academic schools, department or disciplines. The grid can also be used as a basis for a computer model whereby the outcome of the model is used to compare with the actual allocation of space. The model has proven to be effective since it considers principles such as amounts of space and the different types of staff employed within a

department.
The differences in the actual survey results and the literature review may be due to geographical differences of which Botswana is still behind on a few technological advancements and the ones provided by the literature, may not be practical at the moment, so the respondents may well have chosen the one which may be realistic and possible to implement given our capabilities as far as technology and finances of the university are concerned.

4.6 Evaluation of Hypothesis

At the beginning of the study, the researcher came up with a couple of hypotheses, and these are the very hypotheses that will be evaluated in this section of the chapter.

4.6.1 Hypothesis 1:

The data analysis has proven that all lecture rooms in building 248 are underutilised. Based on these results, the researcher therefore accepts the Null hypothesis that predicted that the lecture room space in building 248 is underutilised, and therefore rejects the alternative hypothesis.

The data analysis has revealed that there is no significant difference between the actual room utilisation and the scheduled room utilisation for all the lecture rooms in building 248, and for this reason, the researcher therefore accepts the Null hypothesis and rejects the alternative hypothesis.

4.6.2 Hypothesis 2:

Based on the results obtained from the data analysis, the respondents agreed with the majority of the factors which affect the utilisation rate of the lecture rooms. The alternative hypothesis was supported and the null was rejected.

4.6.3 Hypothesis 3:

Based on the data analysis, there are multiple guidelines which the respondents provided as the most important. Therefore the alternative hypothesis provided in chapter one was supported and the null hypothesis was rejected.

4.7 Limitations of the study

The larger number of students in the sample size may not reflect on the factors affecting utilisation rate of lecture rooms in Building 248 as these are booked and used by lecturers even though there is agreement in the way the factors were scored. Disproportionate Stratified random sampling could have been ideal for this study as more lecturers than students could have been picked just to appreciate their perceptions and views on the utilisation rate of Lecture rooms in Building 248.

5.0 Summary, Conclusion And Recommendations

This previous section presented, analyzed and discussed the data that was received from the questionnaires' handed to building occupants (lecturers and students) and facility manager. The purpose of this section is to give a brief summary of findings, conclusion and recommendations that could be done to ensure that space is utilized effectively in building 248. In addition, a suggestion of further areas of study that could be embarked on by other academicians is outlined.

5.1 Summary of Key Findings of the Study

The purpose of this study was to evaluate efficient space utilisation in thorough evaluation of the level of utilisation of lecture room space in building 248 in the University of Botswana by providing a comparison between scheduled uses of lecture rooms against the actual use of the rooms. There were three objectives that were posed at the beginning of this study. The results of each objective are summarized below.

5.1.1 To determine the utilisation rate of lecture rooms in building 248.

The utilisation rates of all the lecture rooms in Building 248 was very low, signifying that the lecture rooms are under-utilized as they were all below the lowest acceptable benchmark of 75% for all instructional spaces. The room with the highest utilisation rate is lecture room 4 which has a utilisation rate of 26.67% and the lowest is room 11 which has a utilisation rate of 10.24%. The conclusion that can be drawn from this underutilisation is that the available space provided for educational purposes, is not being fully utilized and thus Building 248 is not space efficient in this sense (From a utilisation point of view considering that there are other space efficiency elements that can also be tested). This is an indication that there is enough room to increase the enrollment from 17,000 students to about 25,000 students.

5.1.2 To assess the factors which affect utilisation rate of lecture rooms in building 248.

The various factors have been assessed and the results revealed that overall the respondents (students, lecturers and facility managers) agree with the majority of the factors which were provided to them. The results as provided by the students gave a mean score of 2.32; the results of the Facility managers gave a mean score of 2.06 while those of lecturers gave mean score of 2.15. All the mean scores of the factors according to the scale provided in the questionnaire showed that the respondents agreed that the factors provided do indeed affect the utilisation rate of lecture room space in Building 248.

5.1.3 *To provide guidelines on improving utilisation of lecture rooms in building 248*

There are a number of guidelines which were provided as essential in improving the utilisation rate of lecture room's space however the one ranked as the most important was the implementation of a Space Management System. This was different from what the various literature reviewed suggested as most authors whose opinions were in line with the Tertiary Education Facilities Management Association were all leaning towards the use of a form of Indicative space model to increase the utilisation of space. However these differences between the field survey results and the recommended guidelines as per literature may possibly be due to the geographical differences as this study is conducted in Botswana where such technological advancements may not necessarily be available here or it may be a financial burden on the university itself such that they opted for a more realistic guideline/ space efficient practice instead.

5.2 Conclusions and Implications of the Study

The study has thoroughly addressed the objectives that were posed at the beginning of this study. Secondly, the research has contributed to new knowledge as no study has specifically investigated utilisation of learning spaces in university buildings in Botswana. The survey results provide a strong foundation for future research studies on space efficiency in tertiary institutions.

5.2.1 Implications on policy framework, theory and practice

The first implication of this study is that it may encourage the space planning officers and facility managers to formulate and implement a room allocation and space utilisation policy for classrooms. This policy would provide guidelines and strategies on how lecture room spaces could be effectively utilized. This would in turn result in savings costs for future

construction and maintenance. The study also encourages for implementation of space management system for university buildings. In terms of theory, this study explained the factors affecting space utilisation of lecture rooms and guidelines that can help improve space efficiency in learning institutions.

5.2.2 Implications on academia and society

This study improves the existing body of knowledge regarding space efficiency in university buildings. It paves way for further research to be undertaken on space utilisation and its benefits with particular emphasis on Botswana. This research can also benefit facility managers as it provides guidelines and recommendations that they can adopt to enhance usage of lecture rooms. In addition, it is of benefit to students and academic staff as at large as it promotes enhanced use of lecture room spaces, thereby resulting in occupants' satisfaction with buildings.

5.3 Recommendations

The following are recommendations which could possibly yield positive results and bring about a noticeable change in future. The researcher therefore recommends that;

- A detailed report should be compiled by the facility managers responsible for FET Building 248 with the help of the personnel from the scheduling office, which will entail how the space was used throughout that semester or academic year to indicate if at all the lecture room spaces are used accordingly or being underutilized.
- The implementation of a space management system to help manage the lecture room spaces in building 248 and their uses.
- Finally the implementation of a room allocation and utilisation policy to govern the way in which rooms are utilized and also to set standards and regulations on the criteria to adopt when allocating rooms for use in the university.

5.4 Further Areas of the Study

The research recommends on the areas to be further studied;

i. A study on the various space efficiency techniques besides utilisation of space
ii. They assess the significance in the differences of how FET students/lecturers answer questions in comparison to non-FET students/lecturers
iii. The relationship between the factors which affect space utilisation and the utilisation rate of the building as a whole
iv. The use of a much more appropriate sampling technique such as *disproportionate*

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POST OCCUPANCY EVALUATION OF THE FACULTY OF ENGINEERING AND TECHNOLOGY BUILDING IN THE UNIVERSITY OF BOTSWANA

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Abstract

The objective of the study was to analyse the performance of the Faculty of Engineering and Technology (FET) building and to find out if the users of the building are satisfied with the services provided by the building. Post occupancy evaluation (POE) was used to analyse the performance of FET building. A quantitative research approach was chosen for this study. Primary and secondary data sources were used for data collection. Primary data was collected using a questionnaire and an interview guide. Questionnaires were administered to students, lecturers, cleaners and security guards who regularly utilise FET building. Interviews were held with facility managers who are responsible for maintenance of FET building. A simple random sample from a population of 1453 users was used to sample the study. A sample of 96 respondents was selected, comprising 76 students, 12 Lecturers, 1 facilities manager, 5 security guards and 3 members of cleaning staff. Microsoft Excel was used to analyse and present the data. The findings reveal that the building occupants are moderately satisfied with FET building. Many complaints are reported in the FET building on few defects such as broken elevators, leaking pipes, and faulty air conditioners, leaking water closets and burnt bulbs etc. to the Faculty's Facility Manager every year. These building defects results in students and lecturers not being satisfied with the building as they have a negative impact on learning and teaching. It was also revealed that climate affects the performance of FET building. The study recommends that there should be proper maintenance requests or reports on building defects should be fixed timeously. This will encourage users to report any defects that need to be addressed in the future to facility

managers. This study has created a context in which a building performance evaluation can be conducted and used to improve building satisfaction among occupants. It is also of utmost importance to facility managers, architects, contractors and other who professionals will be involved in future college projects. Professionals and stakeholders are among those who will benefit from this study as it adds to the body of knowledge in Botswana.

Keywords: Post-occupancy evaluation (POE); Building performance evaluation (BPE); Faculty of Engineering and Technology (FET)

1.0. Introduction and Background of The Study

Buildings represent a significant portion of assets, operating costs and user needs of most educational institutions(Okolie, 2011). The performance level of buildings is therefore critical to the academic success of each and every student. In addition, optimal performance of buildings facilitates effective teaching and learning. Even though buildings of higher learning are a crucial resource in academic achievement and learning, evaluation of building performance is not conducted by facility managers in higher learning institutions (Ilesamni, 2010). Management and maintenance are very important to a building and its facilities. Building conditions such as its age, heating and cooling systems, lighting, air ventilation, choice of wall colours, type of furnishing and room layout and many more, have all been associated with significant, measurable changes in student attainment and performance (Anon., n.d.). Users of a building expect better performances from buildings they procure and occupy. Therefore educational building facilities are a major investment to any learning institution such as the University of Botswana. There are many instances where a building does not perform as expected despite following the stipulated building codes and design guidelines.

The University of Botswana is faced problems related to poor performance of recently constructed buildings, one of which is the FET building. This building has incurred exorbitant repair costs. The question is what is the problem? How is it possible to build a building based on regulations and design requirements and still not perform as expected? What is the best course of action to find these errors and what are the solutions? Since many buildings sometimes do not function as planned and can affect the building's operating costs, employee and student satisfaction and performance, health, safety and comfort, an analysis

was conducted using the POE method. This was done to obtain feedback from users of the FET building on its performance. Post occupancy evaluation is a tool for facility managers to identify and evaluate the behaviour of a building (Steinke, et al., 2010). POE can then provide planning and design guidance for future facilities (Tookaloo & Smith, 2015). One of the purposes of POE in higher education is to ascertain whether facilities management is meeting its primary objective of maintenance and space management of buildings to achieve the educational visions of learning institution.

“Post-occupancy evaluation is a process of consistently evaluating the performance of buildings after they have been constructed and used for some time (Hadjiri & Crozier, 2009).”POE integrates stakeholders, construction disciplines, research traditions and the building life cycle in a variety of ways. In particular, assessment of a building's lifecycle will regularly require POE more so that we are trying to move towards a sustainable built environment. An occupancy evaluation assesses how well buildings are meeting user needs, and identifies opportunities to improve the building's design, performance and usability. This evaluation method has helped organizations involved in the provision of new buildings to become aware of the needs of users and also to participate in the feedback mechanisms which result in a cyclical construction process (Ilesamni, 2010). The performance of building occupants or users in any organization or institution depends on the condition of the building itself and the facilities available in the building. Failure to address user needs can result in poor building utilisation and loss of productivity, contributing to the demise of many organisations. This is why (Gabr & Al-Sallal, 2003) suggest that POE should address only those items that an organisation is willing and able to correct on-site or as part of downstream projects.

Frameworks or checklists have over the years been advanced in order to allow educational facilities to be evaluated in terms of the level in which they successfully enable learning and teaching (Anon., n.d.). Post-occupancy evaluations enhance design checklists by helping to evaluate schools once they are utilised. According to (Anon., n.d.), they must describe the performance of a building, in this case preferably a school building. Most of the evaluative efforts are caught up in quantitative measures of performance for the indoor and outdoor environments. Consequently, most efforts are subjected to this measure and only evaluate the quality of the place, for example, the degree of adequacy of lighting, air ventilation, thermal comfort and so on (Ornstein & Ono, 2010).

POEs are inherently non-experimental and most post occupancy evaluations are single data collection (Pati & Pati, 2013). The duo continue to state that the data collection could be

quantitative or qualitative. Since none of the necessary characteristics of the experiments (comparison groups, random assignments) are taken into account, no knowledge of the cause-effect relationships should be expected. At most a researcher can only expect patterns (hypotheses) as the derived data from POE on the potential existence of some cause-effect relationships.

Several studies have been conducted regarding POE in buildings. (Adewunmi, et al., 2011) conducted a research on the post occupancy evaluation of graduate dormitory facilities at the University of Lagos. The authors noted that building occupants are generally satisfied with the cleanliness, lighting, building temperature, comfort, natural ventilation, space, air quality, fire protection and parking spaces in the university. (Gabr & Al-Sallal, 2003) rated the performance of college educational buildings in the United Arab Emirates (UAE). From the previous researches that were carried out using POE to analyse the performance of the buildings, scholars did not assess the impact of climate on the performance of the building for its intended use therefore that is the knowledge gap for this research.

The FET building is in the University of Botswana. It is in between Block 247 and Block 252, in front of the Business Block (245) and next to the Student Centre. The building has been operating for more than 6 years now and many defects have been reported since it started operating. The building was built using burgundy face bricks externally, plastered and painted walls internally. The building is furnished with ceramic floor tiles in toilets, has natural lighting, ramps that can be used by the disabled and has four elevators and stairways in case of any emergencies. The building according to the school site is approximately 16, 000 sq.m and each block within FET (i.e. Blocks 248, 249, 250 and 251) has 3 floors. The FET building construction began in September 2008 and was anticipated to finish in October 2012 by Italtswana Construction Company. The building is relatively new, it has been operating for at least more than 6 years. Within in its period of operation, the building experienced many faults such as water leakages in the rest-rooms, broken down projectors, water leakages from air-conditioning systems through the ceiling in lecture rooms, faulty elevators and many more. The FET building was chosen in order to figure out the root problem of all these faults rather than treating symptoms. The conclusion drawn from analysing the performance of the FET building would be used to help future projects as well to try and reduce or avoid possible defects on the new buildings.

The FET building was recently built with sophisticated facilities such as elevators, projectors, air conditioners and equipment used by Architecture, Planning, Geomatics students and

other FET students. These facilities are wisely utilised to benefit the students and other users of the building. Many building defects are reported in the FET building such as broken elevators, leaking pipes, faulty air conditioners, leaking water closets, burnt bulbs etc. to the faculty's facility manager every year. These defects can be frustrating to staff and the students and may delay academic progress if the broken or faulty building element is needed to carry out any course work. Not only is it frustrating to the students and staff but also tempers with the school budget especially when fixing of such defects on building elements was not budgeted for at that particular time and only accounted for in the cyclic maintenance budget which takes place after a certain period of time. POE can be seen as multi-faceted tool for solving building problems of the FET building, as it systematically evaluates the performance of buildings and facilities. POE refers to the integration of the needs of people and their workplace. Therefore, POE is the best technique to use. Now a question can also be asked if some of these defects and faults are caused by the country's climate or weather conditions (semi-arid climate). POE strategy should be applied when evaluating the performance of the FET building in the University of Botswana.

The above problem led to the formulation of the research goals and objectives. The general objective of this research was to use POE method to evaluate the performance of the FET building. The objectives are as follows:

1. To determine the satisfied level of the building occupants in terms of building elements, services and the environment.
2. To establish the effect of climate on the performance of the FET building.

This paper's exertion was to illustrate that the University of Botswana particularly the FET building, needs evidence-based plans to permanently address its building issues in the form of revised design standards and monitoring processes. Carrying out POE process will increase accountability for facilities managers; it will standardize best practices and also help the University identify things that need to be carried out on future projects. In addition, POE would ensure that all individuals are ultimately satisfied with the buildings and most importantly cost reduction for unplanned maintenance activities. To achieve the above objectives, the study adopted a quantitative research method by administering a questionnaire to the occupants of the building and interview guide for the Facilities Manager. The recommendations of the study can therefore influence the university management to include POE strategy to achieve the strategic objectives of the institution.

2.0. Literature Review

The review of related literature is arranged into two themes. Theme one discusses the general principles of POE while the second theme discusses how climate change can affect the performance of a building.

2.1 The performance concept of a building

“The 'performance concept' suggests that post occupancy evaluations integrated early into the planning and design programs of agencies as an important part of the construction process (Preiser, 1995).” Preiser further states that the performance concept is based on the assumption that a building is designed and constructed to support, and enhance, the activities and objectives of its users. Performance evaluation and feedback connects customer objectives and performance criteria to the actual measurable building performance. The term 'evaluation' according to Preiser (1995) contains the word 'value' which is essential in the context of post occupancy evaluation. This is because an evaluation must explicitly indicate which and what values are used in determining valuation criteria. For an evaluation to be meaningful, values need to be identified that determine the goals and objectives of those who want their buildings to be evaluated (Khalil & Nawawi, 2008).

2.2 General principles of post occupancy evaluation

This theme entails a discussion on post occupancy concept, purpose of carrying out POE in buildings, POE evaluation methods and barriers to effective POE.

2.2.1 Understanding what post-occupancy evaluation is all about

POE according to Preiser & Schramm (2002) is different from other evaluation techniques and methods as it focuses on the users' needs e.g. comfort, health and safety, security, functionality and efficiency as well as aesthetic quality. POE describes building performance settings rather than manipulating them.

The information used for POE has traditionally comes from three sources, namely occupant comments, bills and metrics and measurements and readings (Cooper, 2001). Post-occupancy helps identify the measurable relationship between building quality and educational outcomes. It provides an extension to other technical evaluations such as operational and maintenance reviews, safety inspections (Khalil & Nawawi, 2008). POE main

motivation is user satisfaction. Post-occupancy evaluation is highly rated in the real estate industry as a necessity to improve the design, construction and maintenance of sanitary and educational facilities (Hadjiri & Crozier, 2009).

Current views on POE suggest that technical performance, financial performance and the impact of the built environment on the working conditions should also be considered. POE provides a mechanism to understand the relationship between buildings and user needs. It consequently, enables formulation of strategies and solutions of improving the environment and making it conducive to accommodate user needs (Khalil & Nawawi, 2008). To construct and operate buildings at a lower cost, there is need to understand how buildings differ in use from what is expected of their design, and this can be only be done through post occupancy evaluation.

Implementing POE has the potential to uncover issues that stakeholders are unaware of, making POE important in the construction industry especially residential, learning, commercial and healthcare buildings, where poor performance of the building affects operating costs, wellbeing of users' and business productivity. However, POE has the limitation that it is less responsive and may not be generic enough. POEs are by nature non-experimental. Most POEs involve one-shot data collection (Pati & Pati, 2013). This could be qualitative or quantitative data. However since none of the necessary characteristics of experiments (comparison groups, random assignments) are implemented – POEs should not be generally be to provide insight on cause-effect relationships (Pati & Pati, 2013). The most one can expect to derive out of POE data is patterns (hypotheses) on the potential existence of some cause-effect relationships (Pati & Pati, 2013).

2.2.2 Purpose of carrying out POE

The main purpose of carrying out POE is to verify that a building is operating as expected. This would lead to an important addition to an improved design process. The result of carrying out POE can only be positive and the true successes can be recognized and repeated in the future. If some aspects of a building do not meet required expectations or if innovations are missing their targets, these will be disclosed (Cooper, 2001). Facility managers and construction industry professionals carry out post-occupancy evaluations to manage existing facilities and aim at improving future designs. Post-occupancy evaluation collects insights that will be helpful in making better use of a building and improve on worker productivity (Khalil & Husin, 2009). Post occupancy evaluation is important for long-term reviews e.g. 3-5 years of occupation for example, to assess how buildings are likely to meet future needs and whether

they have been able to respond to changing need so far (Hadjiri & Crozier, 2009). Reviews can also be used to re-evaluate the brief's functional and technical performance requirements of the building types. The findings will inform and feed forward into the future estates strategy (Gabr & Al-Sallal, 2003).

2.2.3 An analysis of post-occupancy evaluation

"Post occupancy evaluations are done by people and companies who are familiar with human behaviour and building design. Ideal candidates have experience in both design and environmental psychology or environmental design (Khalil & Husin, 2009)." Krawczyk (2015) further added on that "while many design firms include evaluations into their design packages, few of these evaluations go beyond measuring how well the design goals were met." It is important that the changing needs of the users are met. Needs must be properly determined at the time of design programming otherwise the design will not serve its users well. The user's needs often change from initial design goals so even if the design considerations were well researched, the building will still not fully satisfy the users. "POE can be performed across all sectors within the business, including facilities management staff, to gauge feeling and satisfied with their own working environment (Shah, 2007)." According to Khalil & Husin (2009) there are three phases and steps involved in conducting POE namely:

1. Planning
2. Conducting and
3. Applying

A. Planning: When the researcher is planning their work, all preliminary agents such as objectives of conducting the post occupancy evaluation are defined. This phase also assesses the building's feasibility study and analyses its functionability. There should be definition of strength and weaknesses of the building in this phase. Researcher should identify the number of users or occupants of the building. This is important in developing a research plan before evaluation starts (Khalil & Husin, 2009).

B. Conducting: Key task in conducting post occupancy evaluation is 'data collection'. At this phase, the occupants of the building are identified in order to develop data collection strategy, whether based on interviews or questionnaires. Evaluation takes place in this phase and it is important to ensure that all data collection procedures are monitored and managed. "After the evaluation is conducted, the data is analysed. This involved the finding and making sense of the data in terms of the questions asked in the beginning of research." (Khalil &

Husin, 2009).

C. Applying: "The application of POE includes reporting on the results, recommending and planning measures. The outcome of the report finding depends on the purpose of the implementation. The purpose could identify problems and failed performance in the facilities. Results of the reports are implemented, measured are taken and the effects of the measures are measured (Khalil & Husin, 2009)."

2.2.3.1 Methods that can be used in data collection when conducting post occupancy evaluation

In the data collection phase, various data collection methods can be used when conducting a recruitment evaluation.

Examples of the methods that can be used in data collection:

1. Questionnaires: closed-ended and open-ended questionnaires can be used or a combination of both can be used. For open questions, respondents use their own words to respond to questions whereas in closed questions responses are given for respondents to answer.

2. Structured interviews: a questionnaire constructed. This list is used to ask residents questions in the same order and format to each one of them (Dawson, 2009).

3. Structured observations and walk through: looking at the building and observing how space is utilized. Discussing with users what can be done to improve the performance of the building.

4. Literature search: Reading published literature so as to identify good references regarding a specific topic (Liverpool Hope University, 2012).

5. Focus groups: a group of individuals are required to come together and discuss the topic at hand for the purpose of the study (Dawson, 2009).

2.2.4 Post occupancy evaluation methods

Barrett and Finch (2014) discussed three examples that explains the various techniques and use of POE. They believe that these examples will provide the facilities managers with adequate information to enable them to conduct their own POEs. These are:

Partial user participation –this model was developed by (Preiser, et al., 1998). Users are only partially involved in the evaluation process. Evaluators with adequate experience lead the process and users only participate at the request of those evaluators. This model proposes three levels of effort:

1. **Level 1: Indicative POE** – This POE provides an indication of the success and failure of the overall performance of a building's (Barrett & Finch, 2014). It is usually carried out by experienced evaluators who are familiar with the type of building to be evaluated.

2. **Level 2**: **Investigative POE –** Barrett & Finch (2014) say that this technique is often initiated as a result of a problem identified during an indicative POE. Annotated drawings and photographs may be required as this complex data collection methods to obtain results.

3. **Level 3**: **Diagnostic POE –** This technique aims not only to improve the respective facility to be evaluated, but also to influence the future design of similar facilities (Barrett & Finch, 2014). An in-depth evaluation will require a lot of time and budget to produce reliable results. Multiple methods such as questionnaires, interviews, observations and physical measurements.

Full user participation – Users are fully involved throughout the evaluation. Experienced people in the process of evaluation are still involved, but their function is purely to guide the participants through the process rather than to make judgments (Barrett & Finch, 2014). Every evaluation will include the same three core events which are: introductory meeting; touring interview; review meeting (Barrett & Finch, 2014).

POE as a management aid – POEs not only serve to improve physical conditions but can also act as an aid to management. In POE, the process of consultation can be as important as information collected judgments (Barrett & Finch, 2014).

2.2.5 Barriers to POE

Hadjiri and Crozier (2009) suggests that, the fact that this evaluation method is widely discussed shows a growing frustration with the POE lack of progress toward the core business. Hadjiri and Crozier (2009) also identifies the barriers to widespread adoption of POE as costly, protects professional integrity, time and skills. A number of significant barriers to the widespread adoption of POE include fragmented incentives and benefits within the procurement and operation process, lack of agreed and reliable indicators, potential liability for owners, exclusion from the current delivery expectations and exclusion from professional

curricula (Zimmerman & Martin , 2010). POE is not regarded as part of an architect's normal services to their client, thus, client organizations are unlikely to pay for POE unless the benefits of such evaluations are both evident and substantial in value (Zimmerman & Martin , 2010).

2.3 Effects of climate on the built environment

The world's climate is changing. The 1990s were the hottest decade since the 1860s, and the 1900s the warmest century of the millennium (Camilleri, et al., 2010)." The implicit assumption that climate is static, bounded by known extremes and that it changes only slowly with time, is no longer tenable (Camilleri, et al., 2010). Argument still persists about whether recent changes in climate have been influenced by anthropogenic greenhouse gas emissions, but this cannot alter the fact that the climate has changed significantly over years, and the best predictions suggest that more changes are on the way. Therefore the risks of future climate change to buildings should be managed.

Adequate planning and preparation can make brick construction possible in virtually all weathers. Cold and hot weather can negatively affect masonry materials and the quality of constructed masonry (Brick Industry Association, 2006). This is to say that weather conditions affect the design, construction, and performance of buildings. A detailed discussion below explains how changing weather conditions affect building materials in a building.

2.3.1 Impact of weather on buildings

Weather affects every aspect of a building and what is used to construct a building. The following are:

- **Concrete:** Dry weather can cause the water in concrete and masonry to evaporate too quickly. This will cause a production of concrete with lower compressive strength and a finished concrete that tend to curl upward and to spall (Crissinger, 2005). Cold weather can cause ice crystals to form and retain moisture. Cool temperatures can also slow the curing, which may affect concrete strength, promote spalling, and can ruin the finish.
- **Masonry mortar:** Hot and dry weathers similarly to concrete causes the moisture from the masonry and mortar to rapidly evaporate causing the mortar to set prematurely. This means that the mortar will set prematurely and there may be insufficient moisture to ensure that brick absorbs mortar paste properly (Crissinger, 2005).
- **Brick:** if not damped prior to laying, they become dry and when laid, they absorb the

water from the mortar too quick that the paste creating the bond between the brick units is not absorbed. Brick is a reservoir for moisture. When damp brick heats up from the sun, the warmth causes the moisture to move toward the cooler interior. "Unless the building is designed and constructed with an interior rain screen and through-wall flashing, the moisture will continue to migrate inward and condense on the cooler interior wall (Crissinger, 2005)." When the brick absorbs moisture it expands and as it expands it can break adjacent bricks and open mortar when fog or mist are present (Crissinger, 2005).

- **Foundations**: In cold climate, founding bases must be set below the frost air to prevent heaving. The colder the climate, the deeper the frost parentage, and consequently, the deeper the foundation. If the foundation is above the frost line, freeze -thaw cycles can cause excessive structural movement (Crissinger, 2005).
- **Paint:** Weather can affect both paint work and performance. During application, if the ambient temperature or the substrate control surface temperature is too high or the relative humidity is low, the reducing agents (solvents) in the blush will evaporate too quickly. This rapid evaporation prevents the paint from curing properly, which can lead to delamination, wrinkling, bubbles, peeling, and cracking. Most paint containers indicate the ambient and substrate temperature range. Some paint manufacturers give a recommended range of relative humidity. Exposure to ultraviolet (UV) rays is the worst enemy of paint performance (Pati & Pati, 2013). Cold temperatures can cause substrates (water-based paints and solvents in solvent-based paints) to freeze or thicken and delay the hardening process.
- **Seals and Sealants**: freeze thaw cycles and exposure to ultra violet light reduces the resiliency of seals and sealants, resulting in loss of elasticity hence causing embrittlement (Crissinger, 2005).
- **Fibrous and Porous Products:** Fibrous and porous materials, including wood, fiber insulation, drywall, carpet, and masonry, are models of materials that absorb and retain moisture. To prevent distortion and damaged conclusion, these token should be kept dry and protected before, during, and after construction **(Crissinger, 2005)**.
- **Roof**: The geographic location (coastal or inland area, open or wooded area, urban or rural area, etc.) of a structure or the shape and height of the building can influence wind elevation or uplift pressure on a roof. Strong winds can create enough wind uplift to cause severe damage. (Crissinger, 2005).
- **Doors and windows**: The infiltration of air and humidity is directly proportional to the pressure generated by the speed of the wind. The expected wind speed and the height of doors and windows must be taken into account during construction and installation. In dry climates and fine soil, manure can easily swirl through inadvertent cracks in doors and

windows and leave a small groove of soil along the crack(Crissinger, 2005).

- **Building:** Building operation can be significantly improved by draining everything from the cap to the basis (from roof to foundation). Wetness or moisture are intruders that will penetrate the building shell of the best defended structure. However, once moisture breaches the building shell, drainage provisions can be used to gaining control it and direct it to the exterior(Crissinger, 2005).

3.0. Methodology

The main purpose of the study was to conduct a POE of FET building to determine the performance of the building. An operational framework consisting of diverse set of activities was developed to attain a systematic performance evaluation that concentrates on the users of the sought FET building. The developed framework entailed carrying out a walkthrough investigation, interviewing the facilities manager of the FET building and administering a questionnaire survey to the target population. Walkthrough investigation involved walking through the FET building to analyse the condition of the building and its elements (Hassanain, et al., 2009) explain that preliminary investigation pinpoints the major problematic zones or elements by recording signs of deterioration in and outside the building. The investigation should be backed up with photos. An in-depth face to face interview was held with the facility manager of FET building. The reason why the facilities manager was interviewed is because he is the one responsible for maintenance works in the building. The facility manager also handles all reports and maintenance requests made by building occupants. A Questionnaire was self- administered to 96 building occupants in order to determine users' satisfaction rate. The collected data was analysed hence giving a range of solutions for improving the FET building. The measurement scales that were used in the questionnaire measured what they intended to measure hence ensuring internal validity of the measurement instrument.

The population used for this study was 1453 occupants of FET building in the University of Botswana. This included 1174 students, 179 academic staff, 32 cleaners, 68 security guard and a Facilities Manager. In determining the sample of the study, a proportionate stratified approach was used to sample the population. A sample is a set of respondents (people) selected from a larger population for the purpose of a survey. Therefore, sampling can be said to be a technique that is employed to select an appropriate sample to try and find the parameters or characteristics of the whole population. Table 36 shows the total number of

Table 1: Staff numbers in FET

Department	Number of staff
Civil engineering	40
Faculty office	30
Mechanical engineering	31
Electrical engineering	23
Industrial engineering (IDT)	25
Architecture and Planning	30
Total	179

Source: FET Human Resource Office (2017)

Table 2 shows the number of all students in FET.

Table 2: Number of all students in FET

Program	Male	Female	Year 1	Year 2	Year 3	Year 4	Total
Bachelor of Architecture	78	34	27	23	18	15	112
Bachelor of Design and Tech	29	4	13	4	5	5	33
Bachelor of Design: Industrial	76	17	41	8	13	11	93
Bachelor of Engineering: Civil	124	42	0	162	4	0	166
Bachelor of Engineering: Beng	85	36	4	7	22	39	121
Bachelor of Engineering: Construction	31	9	0	1	5	9	40
Bachelor of Engineering: Electrical	93	18	8	3	31	20	111
Bachelor of Engineering: Industrial	45	23	2	4	17	10	68
Bachelor of Engineering: Mechanical	110	4	3	5	24	36	114
Bachelor of Engineering: Mineral	47	10	4	7	12	6	57
Bachelor of Geomatics: General	44	14	7	18	15	18	58
Bachelor of Land Management	13	18	0	9	9	13	31
Bachelor of Science: Mining	25	4	2	14	11	2	29
Bachelor of Science: Real estate	27	44	35	12	9	15	71
Bachelor of Science: URP	36	24	24	10	11	15	60
Diploma in Mining Engineering	3	0	0	0	3	0	3
Master of Arts Prof URP	2	5	1	0	0	6	7
Total							**1174**

Source: (FET Faculty Administrator, (Dingalo, 2017)

staff in all the Departments in the Faculty of Engineering.
There were 68 security guards, 39 worked during the day and 29 in the night shift. According

Staff	179
Students	1174
Cleaners	32
Security guards	68
Total	1453

Source: Field survey

The calculation is as follows;

Table 4: **Population sampling using proportionate stratified sampling technique**

Study population	Number	Formula	Sampling
Staff in FET	179	(94/1453)* 179	12
Students	1174	(94/1453)*1174	76
Security of guards	68	(94/1453)*68	5
Cleaners	32	(94/1453)*32	3
Total	1453		96

Source: Field survey

to cleaners' supervisor, there were 32 cleaners therefore the total population is equal to:
The population of the study consisted of Students, Lecturers (Staff), Facilities Manager, Cleaners and Security Guards as users or occupants of the FET building. According to Botswana Laws, a Research permit is required if one is undertaking research in Botswana as part of ethical considerations. However, this study was conducted within the University of Botswana, therefore IRB review was not necessary.

From the information provided above the sample size was determined using 90% confidence level using Taro Yamane's Formula for definite population which is sample size (n) = Population (N) divided by (1+ Population (N) multiplied by the level of significance or margin of error (e) 10% (Yamane, 1967):

4.0. Data Presentation, Analysis And Interpretation

In this section, the findings from the data collected from the self-administered questionnaire and interview were thoroughly discussed. An interview guide was used to collect data and was analysed using thematic analysis. A presentation of the statistical data followed through the use of tables.

4.1 Findings from the questionnaire

The questionnaire sought to determine the level of satisfied with FET building by occupants. The respondents were required to rate their level of satisfied with the building as well as with

the various components in the building. They were also required to give their opinion on whether climate affects the building. The results are discussed below.

4.1.1 *Question 1: Are you satisfied with the FET building?*

The first question asked the respondents to note their level of satisfaction with the FET building. The findings from the students revealed that;

- 100% of first years are satisfied with the overall services provided by the building.
- 81.82% of the second year students are satisfied with the overall services offered in the building (9/11 * 100).
- 50% of the third years are satisfied (18/26 * 100)
- 58.62% of the fourth years are satisfied (17/29 * 100)
- 71.43% of fifth years are satisfied (5/7 * 100)

Academic staff were generally satisfied with the building. This was shown by 75% (9/12 * 100) for lecturers indicating that they are satisfied with the building whilst 25% were unsatisfied.
In terms of the cleaners and security staff, the results reveal that 83.33% (5/6 * 100) of respondents are satisfied with FET building whilst the remaining 16.77% are not satisfied with the building.

From the above, one can note that the occupants of the FET building are satisfied and these results are in agreement with what other previous studies had (Shah, 2007; Krawczyk, 2015) noted.

The researcher had kindly asked the cleaners to list down all the problems they see within the building elements while cleaning and here are what they gave:

- *"Most of the air conditioners are not functioning well and need serious attention, they drip water into offices wetting carpets and leaving unpleasant smell.*
- *Water is always on the floor, which is a draw back to them if the air conditioners are left un-attended because they would spend the whole day just mopping the floors.*
- *Toilets are leaking and even if they are reported they take too long to be fixed.*
- *Door locks are breaking down making door operations very difficult.*
- *They encounter the problem of colour of walls because they easily catch dirt mostly due to the fact that students put their shoes on the walls all the time, so there are always black stains on the walls"*.

From the above narratives, one can say that though occupants are satisfied with the building there a number of issues that still need to be attended to in order to improve the performance

of the FET building.

4.2.2 *Question 2: Please rate the satisfaction level of the following facilities in the building on a Likert interval scale of 1-5.*

In order to address this question, the respondents were asked to rate their level of satisfaction using an interval five point Likert scale of strongly satisfied (SS) 5, Satisfied (S) 4, Moderately Satisfied (MS) 3, Dissatisfied (D) 2 and Strongly Dissatisfied (SD) 1. After collecting the results, the mean or average score for the factors were determined.

The scoring criteria used was that a mean score of less than 1.49 indicates that respondents on this factor are strongly dissatisfied with building components; for a mean score between 1.5 and 2.49 indicates that they are dissatisfied; an average score between 2.5 and 3.49 shows that there is Moderately satisfied with the building elements; for an average score between 3.5 and 4.49 means they are satisfied and for an average score greater than 4.5 indicates that the respondents are strongly satisfied with the elements in the building. Tables 5, 6 and 7

Table 5: Student responses

No	Performance criteria	Mean score	Remark
1	Elevators	2.55	Moderately satisfied
2	Projectors	3.00	Moderately satisfied
3	Air conditioners	3.07	Moderately satisfied
4	Ramps for the disabled	3.18	Moderately satisfied
5	Door conditions	3.18	Moderately satisfied
6	Speakers	3.24	Moderately satisfied
7	Safety	3.33	Moderately satisfied
8	Internet facilities	3.45	Moderately satisfied
9	Air ventilation	3.47	Moderately satisfied
10	Building communications	3.50	Satisfied
11	Lecture rooms	3.55	Satisfied
12	Good open spaces	3.57	Satisfied
13	Overall environment of FET	3.59	Satisfied
14	Natural lighting	3.63	Satisfied
15	Floor finishes	3.64	Satisfied
16	Office conditions	3.64	Satisfied
17	Toilets	3.66	Satisfied
18	Tables and chairs	3.67	Satisfied
19	Level of cleanliness	3.67	Satisfied
20	Ceilings	3.75	Satisfied
	Average	**3.42**	Moderately satisfied

Source: Field survey

shows a summary of the results from students, lectures, cleaning and security guards.
It is evident from table 5 that students are satisfied with half of the building components in FET building. This shown by mean score within the range of 2.5-3.49. The respondents have moderate satisfied with other components such as air conditioners, elevators, projectors, speakers, door conditions, air ventilation and internet facilities. The students opine that projectors and speakers at times do not work thus frustrating learning process. They also add that air conditioners and elevators breakdown thus causing an inconvenience to them. However, they state that even though these components sometimes breakdown,

Table 6: Lecturer responses

No	Performance criteria	Mean score	Remark
1	Elevators	2.08	Dissatisfied
2	Projectors	2.25	Dissatisfied
3	Air conditioners	2.33	Dissatisfied
4	Speakers	2.92	Moderately satisfied
5	Air ventilation	2.92	Moderately satisfied
6	Door conditions	3.00	Moderately satisfied
7	Ramps for the disabled	3.08	Moderately satisfied
8	Tables and chairs	3.17	Moderately satisfied
9	Building communications	3.30	Moderately satisfied
10	Toilets	3.42	Moderately satisfied
11	Good open spaces	3.50	Satisfied
12	Safety	3.50	Satisfied
13	Lecture rooms	3.58	Satisfied
14	Natural lighting	3.58	Satisfied
15	Floor finishes	3.58	Satisfied
16	Office conditions	3.58	Satisfied
17	Overall environment of FET	3.75	Satisfied
18	Ceilings	3.83	Satisfied
19	Internet facilities	3.83	Satisfied
20	Level of cleanliness	4.00	Satisfied
	Average	**3.26**	Moderately satisfied

Source: Field survey

maintenance personnel always work timeously to fix them.
According to lecturers, building components such as air conditioners, elevators and projectors are the main building elements that they are not satisfied with as depicted in Table 6. They mention that faulty air conditioners affect learning. When classrooms get too hot it prevents students from learning as they tend to lose concentration and sleep in class. They also mention that they are frustrated with poor working projectors in FET building. The respondents mention that they often require assistance from technicians to fix the projectors

when class commences. This results in delay in teaching, hence resulting in dissatisfied. On the other hand, the respondents are satisfied with the lecture rooms, ceilings, natural lighting, office conditions, safety and internet facilities in the building. They mention that the

Table 7: Guards and Cleaners responses

No	Performance criteria	Mean score	Remark
1	Door conditions	2.17	Dissatisfied
2	Elevators	2.60	Moderately satisfied
3	Toilets	2.67	Moderately satisfied
4	Air ventilation	2.67	Moderately satisfied
5	First aid kit	2.83	Moderately satisfied
6	Desk and chair	3.17	Moderately satisfied
7	Open spaces	3.17	Moderately satisfied
8	Overall environment of FET	3.17	Moderately satisfied
9	Level of cleanliness	3.30	Moderately satisfied
10	Building safety	3.33	Moderately satisfied
11	Ramps for the disabled	3.50	Satisfied
12	Floor finishes	3.50	Satisfied
13	Telecommunications	3.50	Satisfied
14	Lecture rooms Natural lighting	3.67	Satisfied
15	Ceilings	4.00	Satisfied
16	Office conditions	4.00	Satisfied
	Average	**3.20**	Moderately satisfied

Source: Field survey

sizes of the lecture room are adequate enough to accommodate a large number of students.
The results from Table 7 indicate that security guards and cleaners are generally satisfied with a few components in FET building. These components are natural lighting in classrooms, floor finishes, telecommunications and rams for the disabled but dissatisfied about door conditions.

It is also noted that all the respondents were moderately satisfied with the performance of the FET building and this corroborates well with what was noted in the interview with the Facilities Manager that "*the building performs well as intended even though some people may never really be satisfied with what the building has to offer*." These results are similar to a study that was conducted by Adewunmi, et al., (2011) on postgraduate hostel facilities in the University of Lagos in Nigeria but contrary to what Gabr & Al-Sallal (2003) had found in their study.

ANOVA was used in Table 9 below in order to establish if there was a statistical significant difference in how the three groups (students, Lecturers, Cleaners/Guards) had rated the

variables that were used to evaluate the FET building. It was established that since the computed F value of 1.07 was less than the critical value of 3.17 at degrees of freedom (DF) (2,53), we believe that there was no significant statistical difference in their perception and views about the performance of the FET building between the three groups and within each group as well. Therefore, the null hypothesis is accepted and the alternative hypothesis is

Table 8: ANOVA single factor

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Students	20.00	68.34	3.42	0.09		
Lecturer	20.00	65.20	3.26	0.30		
Cleaners/Guards	16.00	51.25	3.20	0.26		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.46	2.00	0.23	1.07	0.35	3.17
Within Groups	11.25	53.00	0.21			
Total	11.70	55.00				

rejected. They all agreed that they were moderately satisfied with the FET building.***4.2.3 Question 3: Do you think colour of the walls affect your work performance?***

The survey revealed that majority of the students, 89% believe that the colour of the walls has an effect on their performance. Only 11% believed that the colour of the walls does not impact on the productivity performance.

4.2.4 Question 4: Does climate affect the performance of The FET building that you occupy? Would you say it somehow temper with the building materials?

Responses from the questionnaire and interview with the Facilities Manager revealed that "*Climate affects the performance of the building. Botswana's weather is semi-arid although it is hot and dry for most of the year there is a rainy season, which runs through the summer months (November, December, and January)*". Below are some of their reasons to support their answer:

The respondents indicated that "*FET building is cold during winter and hot in summer. It should be the other way round. The respondent went on to say that the building should have been designed to accommodate the weather condition variation. One respondent said that the sun heats the roofing which brings in natural light, the material that was used to design it is not as durable as iron sheets therefore it gets damaged leading to roof leakages which will eventually damage the ceiling. If air-conditioners are working the building cannot cool itself during summer and vice versa. Another respondent said offices get extremely cold during winter or extremely hot during summer. And during the rainy season, there are leakages through the ceilings into offices and lecture rooms*". The researcher's observations also found that, many students gather on the ground floor benches of Block 248 in FET to use the internet and to study during the day. The disabled people are well catered for by the building because there are ramps designed for them to use to move around.

The results revealed that the weather affect the performance of the FET building on visible building elements such as windows, roofing, walls, plaster and painting. This is in line with what other studies (Brick Industry Association, 2006; Crissinger, 2005; Camilleri, et al., 2010) had also noted.

4.3 Findings from interview with the facilities manager

The Facilities Manager was interviewed to get information that the respondents could not provide.

The facilities manager stated that "*the building has been in operation since 2013. The type of maintenance that they use to maintain FET building is Day-to-Day maintenance where every building element is inspected and attended to if there are any defects. He added on that the budget is never exceeded because there is usually enough money reserved for any repairs that may be costly*".

The Manager said that "*the building performs as intended even though some people may never really be satisfied with what the building has to offer. He also added that the finishes of the building suit the learning environment. He mentioned that the only mistake that he could recall was that there was a projector which was put in the woodworks lab that was not supposed to be there because the building is always going to be dusty and the projector cannot function under such conditions. Another mistake that was made was with the plaster of walls in one room in Block 250. The plaster was about 30 – 35mm which was very thick and started cracking but the plaster was eventually removed. A POE has never been carried out*

about the building. The facilities manager said that the building cannot handle change and growth because many facilities are not designed to carry so many weights of students and other occupants therefore the lifts would break down. This means that a lot of things will need to be changed in order for them to accommodate change hence more expenses".

From this study, it is noted that a higher number of students was used to assess the performance of the FET building even though they do not spend most of their time in the building than that of lecturers who spend most of their time in the building. This is a limitation to the study though there is agreement on most of the variables that were used to assess the performance of the FET building.

5.0. Summary, Conclusion And Recommendations

The previous section presented, analyzed and discussed the data that was received from the questionnaires' handed to building occupants (lecturers and students) and interview with facility manager. The purpose of this section is to give a brief summary of findings, conclusion and recommendations that could be done to improve satisfied and building performance of FET building. In addition, a suggestion of further areas of study that could be embarked on by other academicians is outlined.

5.1 Summary of key findings of the study

The purpose of this study was to use POE method to evaluate the FET building's performance and determine users' satisfied with the building. There were two objectives that were posed at the beginning of this study. The results of each objective are summarized below.

5.1.1 *To determine the satisfaction level of the building occupants in terms of building elements, services and the environment.*

The conclusion that is drawn from this study is that occupants of the FET building are moderately satisfied with the overall performance of the building although they raised a few complaints on the performance of elevators (mean 2.55 students, 2.08 for lecturers and 2.6 for security guards and cleaners), projectors (2.25 mean score of lecturers) and speakers (2.92 mean score of lecturers). The research shows that the design of the building to let in natural lighting is on point because students are happy with the fact that there is ample lighting in the building during the day.

5.1.2 To establish the effect of climate on the performance of the FET building

Climate affects the performance of the FET building. FET building is cold during winter and hot in summer. In normal conditions, a building should provide warmth when it is cold and eliminate heat when it is too hot. Buildings should be designed to accommodate changes in weather conditions. Building material should be selected properly looking at the climate and weather conditions. The roofing material used in FET building is not durable as compared to iron sheets. Therefore during rainy seasons there tends to be leakages in offices and classrooms as the roof has been damaged. This also damages the ceilings.

5.2 Conclusions and recommendations of the study

The study has thoroughly addressed the objectives that were posed at the beginning of this study. Secondly, the research has contributed to new knowledge as no study has specifically investigated building performance of University buildings in Botswana. The survey results provide a strong foundation for future research studies POE in tertiary institutions. The study concludes that the performance of the FET building is moderately satisfactory based on the aggregate score of the responses from the study sample. However, there are some areas that they showed dissatisfaction about such as door conditions for cleaners and Guards, air conditioners, elevators and projectors in the lecture rooms for lecturers. The implication of these findings to the institution is that if they are not attended to, the level of satisfaction for these users will be highly affected which might end up compromising their productivity as well as academic performance for students.

5.3 Recommendations

The study therefore recommends that:

- The University should ensure that building materials used in construction of learning facilities are durable and can withstand the continuously changing climate and weather conditions and that all defects that were identified as a cause of dissatisfaction should be attended to.
- There should be constant training and development of staff on building performance evaluation to keep up with latest technology should be encouraged by the institutions; and
- A performance evaluation database for buildings in educational institutions should be developed in Botswana. This would provide information on performance standards and cost of performance evaluation activities thereby helping to improve the

effectiveness of design and evaluation process.

5.4 Further Areas of the study

The research recommends on the areas to be further studied;

i. A study on the various building performance evaluation measures and techniques.
ii. Investigate on building performance evaluation indicators for buildings in higher learning education institutions.
iii. The relationship between building performance measures and academic performance of students in higher learning institutions.
iv. Conduct further research into the performance of educational buildings in other parts of Botswana. Analysing the gaps between the results of such research efforts and those presented in this study could provide an important feedback to educational building facilities managers in higher learning institutions and other building service providers.

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WILLINGNESS TO PAY FOR GREEN BUILDINGS IN GHANA: WHAT ARE THE INFLUENCING FACTORS?

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Abstract

Although green buildings have been found to be more life-cycle cost-effective than conventional buildings, the capital cost of building green remains greater than that of traditional alternatives, especially in the Ghanaian market. As such, for green buildings to gain proliferation in Ghana, adopters must be willing to bear a cost premium. This study tests Ghana's green building proliferation readiness by investigating Ghanaians' willingness to pay a green building cost premium. An online survey was administered and responded to by 1,227 participants, upon which statistical analysis, including ANOVA and correlation analyses, were conducted. 70.1% of respondents showed a willingness to pay a cost premium for green buildings, with 33.4% of respondents indicating a willingness to pay a premium of up to 5% the cost of a conventional alternative. Further analyses revealed statistically significant differences in willingness to pay for green buildings across Education levels, Income levels, Environmental Concern levels, and Green Building Awareness levels. However, no significant differences were found between different ages and genders.

KEYWORDS:
Sustainability, Green building, Willingness to Pay, Influencing Factors, Ghana

1.0. Introduction

Green Buildings according to the World Green Building Council (WGBC, 2022) are buildings that, in their design, construction or operation, reduce or eliminate negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings have been found to provide a myriad of environmental, economic, and social benefits including: a 25% increase in productivity (Ries et al., 2006), a 30% decrease in energy consumption (G. H. Kats, 2003; Ries et al., 2006), a 38% reduction in CO_2 emissions (Balaban & de Oliveira, 2017), a 29% increase in thermal comfort satisfaction (Elnaklah et al., 2021), and a lifecycle cost saving of over 10 times the additional cost of building green (G. H. Kats, 2003).

Due to these benefits, green building interest and adoption have been gaining momentum globally (Anzagira et al., 2019) as a remedy to the significant environmental harms of traditional buildings. This momentum is however found lacking in some parts of the globe (Wuni et al., 2019), particularly in Sub-Saharan Africa where green building uptake remains sluggish and perfunctory (Addy et al., 2020). Ghana, much like other Sub-Saharan countries, remains in the infancy stage of green building adoption (Anzagira et al., 2019; Chan et al., 2018; Darko et al., 2017, 2018; Darko & Chan, 2018; Guribie et al., 2021). Across the country, there is minute government involvement in green building, leaving the mantle on private developers and individuals (Anzagira et al., 2019).

The lackadaisical green building uptake observed in Ghana and Africa at large is cause for concern as the continent will soon become an arena for unprecedented infrastructural development, stemming from the region's rapidly growing population (Komolafe et al., 2016; Oyewolo & Komolafe, 2018). A failure to adopt sustainable building practices will only exacerbate the environmental impacts over time. It is therefore imperative that Ghana and other developing countries within the region widely adopt green building practices within the shortest possible time (Oyewolo & Komolafe, 2018; Plessis, 2007).

Green building uptake in Ghana has however been hindered, more so than in the western world, by many factors, particularly the cost premium over conventional buildings (Ako-adjei & Danso, 2019; Chan et al., 2018). Though these costs will be returned in surplus over the lifecycle of the building (G. H. Kats, 2003), relative to traditional alternatives, green buildings typically incur additional capital costs such as investment in research and development, and more efficient, but more expensive, construction systems (Ofek & Portnov, 2020).
For green buildings to gain ubiquitous traction, consumers' must be willing to pay these

additional costs (Abraham & Gundimeda, 2020; Guribie et al., 2021; Njo et al., 2021; Oyewolo & Komolafe, 2018). But are consumers willing to pay for green buildings? If they are, to what extent? And what factors influence their willingness?

To this end, this paper aims to assess individuals' willingness to pay (WTP) for green buildings in the Ghanaian real estate market and examines the factors affecting consumers' willingness to pay for green buildings. This study will be the first in Ghana, and part of the few in Africa to investigate consumers' willingness to pay for green buildings. The research is imperative to know whether there is a demand for green buildings as well as understand the dynamics of demand for green buildings which is crucial for the adoption of green buildings in Ghana.

2.0. Willingness to pay for green buildings

The upfront cost of building green is amongst the most cited inhibitors of green building adoption (Dwaikat & Ali, 2016; Takuh, Adeyemi, et al., 2021) across the extensively studied area of green building adoption drivers and inhibitors globally (Wuni et al., 2019). In Ghana, previous studies have found barriers such as lack of government support (Darko et al., 2018), lack of demand (Djokoto et al., 2014), and low sensitization (Guribie et al., 2021) as the most significant hindrances to green building adoption. Additionally, Chan et al. (2018) and Ako-adjei & Danso (2019) found initial cost-related barriers as the most significant hindrance to green building adoption. Despite variances in what has been found as the most significant hindrance to green building adoption in Ghana, the upfront cost barrier has been found to be a significant hindrance both in Ghana (Djokoto et al., 2014; Guribie et al., 2021; Opoku et al., 2019), and globally (Chan et al., 2018).

The existence of a higher initial cost of green building construction over conventional alternatives, also referred to as green building cost premium (Dwaikat & Ali, 2016), green building cost surcharge (M. Hu & Skibniewski, 2021), or green premium (G. Kats, 2013), has been debated across the literature (Dwaikat & Ali, 2016; M. Hu & Skibniewski, 2021; Takuh, Abang, et al., 2021). After reviewing 17 empirical studies that investigated green building cost premiums, Dwaikat & Ali (2016) found no conclusive answer to the debate. They (Dwaikat & Ali, 2016) however pointed out that 90% of results revealed the existence of a green building premium within the range of 0.4%-21%, with very little evidence supporting the assertion that green buildings cost less than traditional alternatives. More recently, by reviewing 36 studies, M. Hu & Skibniewski (2021) surveyed over 1,300 cases across 11 countries and confirmed the existence of a cost premium for building green. Their analysis revealed both a

median and mean green building cost premium of 7%, which they recommended to be used as a green premium benchmark (M. Hu & Skibniewski, 2021).

In Ghana, though no research was found quantitatively investigating the cost premium of green buildings, the existence of a green building premium appears to be a widespread conception (Opoku et al., 2019). As Opoku et al. (2019) put it, construction professionals with in-depth green building knowledge in Ghana are of the view that building green comes with a higher initial cost over conventional alternatives.

This cost premium, as reported by Opoku et al. (2019), results in developers' preference for traditional buildings over green alternatives. Developers however must consider the demand of the market (Njo et al., 2021) and will only build green if they are confident that end-users have a preference for and are willing to bear the cost premium of green buildings (Abraham & Gundimeda, 2020; Guribie et al., 2021; Njo et al., 2021; Oyewolo & Komolafe, 2018). Guribie et al. (2021), in their recent study of impediments to green building, concluded that the key to green building proliferation in the Ghanaian market is to have green building expansion driven by the demand of the end-users. But are Ghana's property end-users willing to pay for green buildings? If they are, to what extent?

This research found no empirical evidence measuring the Ghanaian market's willingness to pay for green buildings. There is however ample evidence of willingness to pay for green buildings from other countries. In Nigeria, Takuh, Adeyemi, et al. (2021) found medium-income earners willing to pay a 3.3% premium for green homes. In Indonesia, Njo et al. (2021) found 39.7% of respondents willing to pay a 6-15% premium, and 38.53% willing to pay a 5% premium. In Singapore, Heinzle et al. (2013) found buyers willing to pay a 3.78% premium for the certified award, and 7.98% for the platinum award of the Building Construction Authority Green Mark Scheme. In Israel, respondents to Portnov et al.'s (2018) survey indicated a willingness to pay a 7-10% premium.

Factors Influencing Willingness to Pay

Recently, there has been a high volume of research on factors affecting consumers' willingness to pay for green buildings (Oyewole et al., 2021). However, research on willingness to pay in developing countries and most especially in Africa is scant (Anzagira et al., 2019; Oyewole et al., 2021). In Ghana, no study was found investigating the factors that influence willingness to pay for green buildings. This review found majority of the studies in this regard to have been conducted outside Africa, and to have evidenced several influencing

factors including sociodemographic/ socio economic factors, knowledge/awareness of green buildings, and the preferred green attributes/perceived benefits of green buildings.

Literature on the effect of gender on willingness to pay tends to be variable. Whilst some studies have found gender to be an influencing factor (Attaran & Celik, 2015; Khan et al., 2020), some others have not (He et al., 2022). Even amongst studies that have found gender to be an influencing factor, it remains unclear which gender is more willing to pay. Attaran & Celik's (2015) study on students' environmental responsibility and their willingness to pay found females more willing to pay than males. They however associate this difference to their finding that females are more environmentally responsible than males. This is supported by the assertion of de Silva & Pownall (2014a) that educated females put the greatest value on going green. Conversely, Khan et al. (2020) recently found males more willing to pay for sustainable housing than their female counterparts; associating this occurrence to females being more risk averse and careful in their purchase decisions.

Similar to the effect of gender, the effect of age on willingness to pay seems unclear. Whilst some studies have found older respondents more willing to pay for green buildings than younger respondents (He et al., 2022; Khan et al., 2020), some others have found no correlation (Rosner et al., 2022).

Income level has been found to have an insignificant influence on individuals' desire to go green (de Silva & Pownall, 2014). However, with regard to green buildings, Hu et al. (2014) revealed that the socio-economic status of homebuyers determines their purchasing power and thus their willingness to pay for green attributes, indicating that higher income earners are more prepared to pay for green buildings to improve their living comfort than lower income earners. In contrast, though agreeing to the existence of a correlation between income and willingness to pay, Khan et al (2020) posit that income level has a negative correlation with willingness to pay.

Studies seem to agree on the existence of a positive correlation between level of education and willingness to pay. Educated individuals were found to have a high willingness to pay for green buildings (Attaran & Celik, 2015; de Silva & Pownall, 2014). Khan et al. (2020) also find a positive correlation between level of education and willingness to pay for green buildings.

Attaran & Celik (2015) found a direct correlation between environmental concern and willingness to pay for green buildings. Tan & Goh, (2018) add that consumers purchase intention is largely affected by psychological factors such as attitude towards environmental

concern. Thus, as individuals' concern for the environment increases, their willingness to pay for green buildings increases (Attaran & Celik, 2015; He et al., 2022). Also, people with high self-reported knowledge on environmental issues or environmentally-aware behaviour were found to indicate a significantly higher tendency and/or willingness to pay for green buildings (Golbazi et al., 2020; He et al., 2022; Jang et al., 2018; Y. Li et al., 2014; Rosner et al., 2022).

Ofek & Portnov (2020) revealed that in Israel, consumers more familiar with green building benefits are willing to pay 9.25% of green building price premium as opposed to 7.74% additional costs acceptable to consumers being less familiar with green building benefit; indicating that there exists a positive relationship between knowledge on green buildings and willingness to pay for green buildings (He et al., 2022). The same conclusion was arrived at by Golbazi et al. (2020) who found respondents with higher self-reported green building knowledge willing to pay significantly more for green buildings. Oyewole & komolafe, (2018) assert that the promotion of green buildings and its benefits is of urgency for the successful growth of the green building industry. Njo et al. (2021) add that limited knowledge on green buildings contributes to individuals avoiding risks of purchasing or investing in green apartments. There is therefore the need to sensitize all stakeholders on the environmental benefits of green buildings especially in developing economies if its proliferation is to be achieved (Oyewole et al., 2021; Takuh, Adeyemi, et al., 2021; Zhang et al., 2016). Although all kinds of information can affect consumers' willingness to pay for green buildings, it was evinced that information on the economic benefits of green buildings has the highest influence on willingness to pay (He et al., 2022).

It is obvious that there is no concordance across the literature as to the significance of the identified factors. As Darko et al. (2018) put it, “green building is not the same across the globe”. The significance of influencing factors is likely to differ across locations due to cultural, economic, and regulatory differences (Darko & Chan, 2018). This further highlights the cruciality and significance of a study investigating influencing factors specific to the Ghanaian market.

3.0. Methodology

This study adopted an exploratory mixed-methods research design to investigate the Ghanaian market's willingness to pay a green premium, and the factors that influence said willingness.

The research was undertaken by surveying 1,227 Ghanaians. The survey was designed and distributed online, using the *questionpro.com* platform, to as many willing respondents as possible. This distribution technique was adopted due to the large population size, geographical boundaries among expected respondents, its ability to increase survey distribution, and cost-effectiveness (Abidoye et al., 2022).

The questionnaire began with an introduction, which detailed the purpose of the research and assured respondents of their anonymity and the confidentiality of their responses, followed by three main sections. The first section enquired background information on age group, gender, highest education level, and income level. The second section tested the respondents' knowledge of green buildings, their environmental concern levels, as well as their desire to occupy a green building. These were achieved by means of Likert scales. Respondents were asked to rate their environmental concern from *'I am Not at all concerned'* to *'I am Extremely Concerned'*. With regards to their knowledge of green buildings, respondents were required to rate their perceived level of knowledge on the subject from *'I have never heard of green buildings'* to *'I am an expert in green buildings'*. The desire to live in / occupy a green building was also tested by means of a 3-point Likert scale – *'Yes', 'Indifferent',* and *'No'*. The final section of the questionnaire was designed to gauge the willingness to pay a premium for green buildings over conventional alternatives. Respondents were asked to indicate how much premium they were willing to pay – from *'No premium'* to *'Above 25%'*. Finally, an open-ended question was included to allow respondents to share further thoughts on green building adoption in Ghana, and their ability to pay a green premium.

Prior to the distribution of the final survey, a pilot survey was undertaken to assess the clarity and suitability of the questionnaire. The questionnaire was distributed to 10 sample respondents who provided useful feedback, following which necessary changes and updates were made before the final survey.

The link to the final survey was distributed to target participants, reminders were regularly sent, and any concerns were promptly addressed. Overall, the survey was viewed by 1,872 and responded to by 1,227. However, 232 responses were incomplete and thus removed from the final sample. A final sample of 995 responses was deemed suitable for further analysis. Profiles of the respondents are presented in Table 43.

Following collation of data and exclusion of incomplete responses, normality assumptions were checked to verify the validity of the data for further statistical analysis. Cronbach's test

was adopted to estimate the internal consistency of the data and the reliability of the scales adopted for the study. As established in literature (Attaran & Celik, 2015; Q. Li et al., 2018), a value range between 0.7 – 1 is acceptable, and our test returned a value of 0.842.

Several tests of association were performed to confirm the relationship between our variables. Adopting *'Willingness to pay a premium'* as the independent variable, correlation levels with all other variables were computed. Chi-square tests were also conducted to measure the relationship between our nominal variables *(Age, Gender, Education Level, Income Level, Environmental Concern Level, and Green Building Knowledge Level)* and the willingness to pay a premium for green buildings. Finally, ANOVA analyses were conducted to measure the variance within groups in an attempt to determine how different characteristics of our respondents influence their willingness to pay a premium for green buildings.

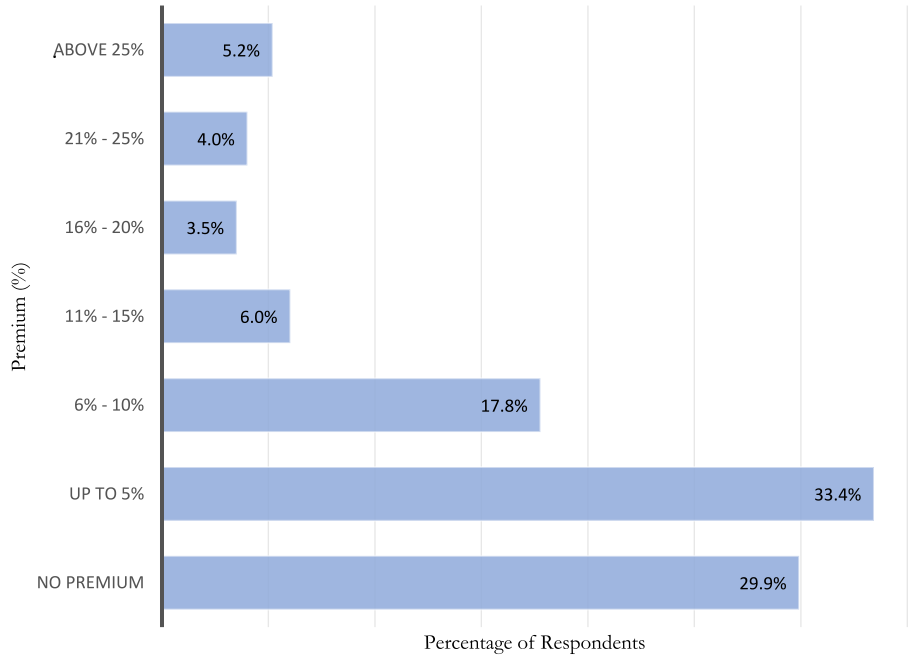
Table 43: Respondents' Profile

Variable	Scale	Frequency	Percentage
Age	Below 20	23	2.3%
	20 - 25	271	27.3%
	26 – 30	284	28.6%
	31 – 35	125	12.6%
	36 – 40	78	7.9%
	41 – 45	79	8.0%
	46 – 50	49	4.9%
	51 – 55	35	3.5%
	56 – 60	21	2.1%
	Above 60	27	2.7%
Gender	Male	576	60.3%
	Female	380	39.7%
Education Level	JHS	5	0.5%
	SHS	68	6.9%
	HND/BSc	608	61.4%
	Masters	265	26.7%
	PhD	45	4.5%

Monthly Income	No income		195	19.7%
	GH₵ 1	– GH₵ 1,499	173	17.5%
	GH₵ 1,500	– GH₵ 2,999	238	24.1%
	GH₵ 3,000	– GH₵ 4,499	136	13.8%
	GH₵ 4,500	– GH₵ 5,999	67	6.8%
	GH₵ 6,000	– GH₵ 7,499	53	5.4%
	GH₵ 7,500	– GH₵ 8,999	35	3.5%
	Above GH₵9,000		91	9.2%

4.0. Results and Discussion

The biggest proportion of respondents (33.4%) was only willing to pay up to 5%, with the second largest group (29.9%) unwilling to pay any premium at all. These two groups make up more than half (63.3%) of the respondents. Furthermore, the average respondent was found willing to pay a green premium of up to 5%. Following a 7% green premium benchmark (M. Hu & Skibniewski, 2021), these results highlight a low willingness to pay for green buildings. Only 17.8% were willing to pay between 6% and 10%. Beyond this point, Ghanaians show limited interest in paying more for green buildings, with only 18.8% inclined to pay a green premium greater than 10% the cost of a conventional alternative. These statistics are presented in Figure 3.



Levels of concern about climate change and the environment were generally favourable, with 98.09% of respondents expressing some concern, ranging *'slight'* to *'extreme'* (Figure 4). In the same vein, 75.47% expressed a preference for green buildings over conventional alternatives (Figure 5). Several tests of association were performed to confirm the

Table 44: Correlation Analysis results

Influencing Factor	Correlation with WTP
Knowledge of Green Buildings	0.286**
Income	0.195**
Environmental Concern	0.189**
Education Level	0.187**
Age	0.068*
Gender	-0.029

Note: This table presents level of correlation of all other variables with respondents' willingness to pay a premium for green buildings. ** denotes significance at 5% level, and * denotes significance at 10% level. *'Gender'* did not exhibit any statistically significant correlation with willingness to pay a premium.

Consistent with the literature (Hu et al., 2014), Chi-square tests were also conducted to measure the relationship between our nominal variables *(Age, Gender, Education Level, Income Level, Environmental Concern Level, and Green Building Knowledge Level)* and the willingness to pay a premium for green buildings. The results of the Pearson Chi-square tests are presented in Table 45. The results support our initial predictions – *Education, Income, Concern for the Climate, and Knowledge of Green Buildings* all showed significant association with the willingness to pay a premium. Gender did not exhibit any significant association. This finding contrast those of Khan et al. (2020) who found correlations between the gender demographic and willingness to pay. Yet, the finding is in line with those of He et al. (2022) and Rosner et al. (2022) who found no significant correlation between willingness to pay and the demographics of age and gender.

Table 45: Chi-square Tests results

Variable	Value	df	Asymp. Sig.
Education	65.608	24	0.000
Income	85.210	42	0.000
Environmental Concern	92.009	24	0.000
Knowledge of Green Buildings	129.542	24	0.000
Gender	15.002	6	0.200
Age	58.155	54	0.325

Note: The results of Chi-square tests run to confirm the association between various variables and *'Willingness to Pay a premium'* are presented in the above table. A confidence level of 95% was adopted for these tests. As such, any variable with a significance level below 0.05 was deemed to exhibit statistically significant association with our dependent variable *'Willingness to Pay a premium'*.

ANOVA analyses were also conducted to measure the variance within groups in an attempt to determine how different characteristics of Ghanaians impact their willingness to pay a premium for green buildings. Tests of homogeneity were run to confirm the suitability of ANOVA for further analysis, and the results were significant at 1% level for all variables. Rejecting the null hypothesis confirmed that there are significant differences in the willingness to pay a premium across the different groups. Consistent with previous tests of association (correlation and Chi-square), *'Age'*, and *'Gender'* did not exhibit any statistically significant variations on the willingness to pay. This suggests that the willingness to pay is not unduly affected by these characteristics (He et al., 2022; Rosner et al., 2022), and they were excluded from further discussion.

Education Levels and Willingness to Pay a Green Premium

Significant variances were found between respondents with different levels of education and their willingness to pay a premium. No significant differences were found between JHS graduates and any other groups. Beyond this group, however, significant differences were confirmed between SHS graduates and the higher levels (HND/BSc, Masters, and PhD). No differences existed between Master's graduates and PhD holders, suggesting that Master's-level education is sufficient for an appreciation of the concept of green buildings as well as the willingness to pay for them. A key distinction between these two groups is that PhD holders are willing to pay a higher premium (between 11% – 15% on average) than their Master's counterparts (between 6% – 10% on average). This dynamic is most likely linked to the earning capacities of these two groups, as PhD holders ordinarily earn more than the average employee with a Master's degree. Future studies could explore the bi-directional relationship between education levels and earning capacities, as well as the moderating effects of earnings on the education-willingness to pay relationship.

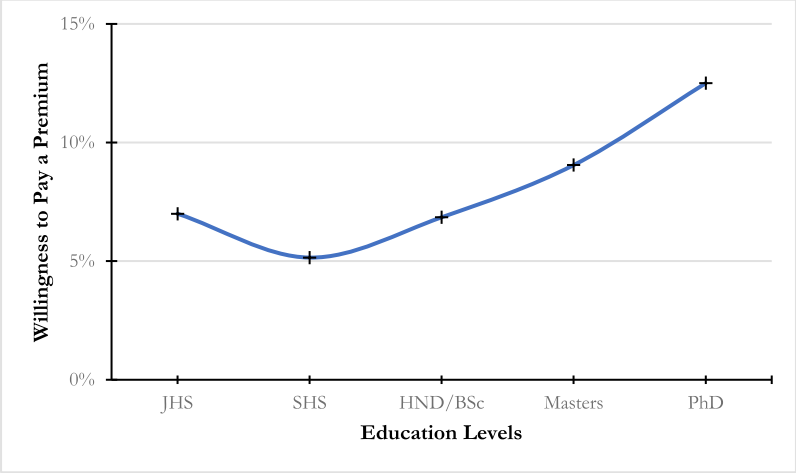


Figure 6: Means Plot: Education Levels and Willingness to Pay a Premium

Income Levels and Willingness to Pay a Green Premium

Consistent with the findings of Hu et al. (2014), who suggest that the wealthier are willing to pay a premium, our results indicate significant differences in the willingness to pay a premium were found across the different income levels. No significant variations were observed between those who earn no income up to those earning below GH₵6,000 per month. In these groups, the average respondent was willing to pay a premium in the range of 6% and 10%. Additionally, several of these respondents included comments citing their interest but an inability to pay a premium due to financial constraints. The average premium increased beyond the GH₵6,000 group, highlighting an increased willingness to pay a premium beyond a certain point on the economic scale. Earners above this point are generally willing to pay a little more for green buildings, perhaps highlighting improved affordability – these respondents are willing to pay premiums between 11% and 15% for green buildings. A few other respondents also implored the government to introduce incentives such as tax breaks and assisted housing finance for Ghanaians who opted for green buildings.

concern, the *unconcerned, somewhat and moderately unconcerned* are all willing to pay similar premiums (no more than 5%). The *more concerned* and *extremely concerned* are willing to pay on average, premiums of 6% – 10%. The highest premiums match those extremely concerned about the environment, perhaps highlighting their appreciation of how urgent a switch to green buildings is for sustainability. Further comments reiterated some concerns about climate change and the preparedness of developing countries such as Ghana, but these cautionary comments still hinted at financial concerns and affordability ratios.

***Green Building Knowledge and* Willingness to Pay a Green Premium**

Our initial hypothesis was that the level of green building knowledge heavily impacts the willingness to pay a premium for them based on the findings of (Golbazi et al., 2020; Njo et al., 2021; Ofek & Portnov, 2020; Oyewolo & Komolafe, 2018). The survey instrument posed a few questions to determine the level of knowledge the average respondent has about green buildings as a concept. These questions indicate an interesting insight on the state of knowledge of green buildings among Ghanaians (Figure 9) – 28.71% have never heard of the term prior to the study while 18.82% have only come across the term but are not aware of its implications. A high proportion indicated a fair amount of knowledge about the concept (28.63%), but only 2.91% have expert-level knowledge.

5.0. Conclusion

Interest in green buildings has gained immense momentum across the globe over the last few decades due to their potential to significantly address climate change concerns posed by traditional buildings (Anzagira et al., 2019). Additionally, the proliferation of green buildings is necessary to achieve sustainable built environments by reducing the environmental impacts of building construction activities. While interest across the globe has undoubtedly increased, the adoption of green buildings has not been as universal. Particularly in developing countries such as Ghana, Addy et al. (2020) suggests that uptake remains limited. Attempts to explain these variations have been made, but with green buildings generally expected to command a cost premium on construction, end-users must be willing to pay a premium to build green, a change in attitude that will in turn, spur developers on (Njo et al., 2021).

We surveyed 995 Ghanaian respondents to determine their willingness to pay (WTP) a premium for green buildings. Our survey instrument first collected background information on our participants, then gauged their knowledge of green buildings, as well as their willingness to pay a premium over conventional buildings. Following collation of these responses, we performed several tests of association and ANOVA analyses to address our primary research question – are Ghanaians willing to pay a premium for green buildings?

Our results revealed generally high levels of concern for the climate, with 98.09% showing some level of concern for the state of the environment. 74.97% also indicated a desire to live in green buildings, given its benefits. However, we found that knowledge of the concept does not match these concern and desire levels – 28.71% and 18.82% have never heard of or only heard of the concept, respectively.

Initial insights on WTP suggest that the biggest proportion (33.4%) are only willing to pay up to 5%, while 29.9% are not willing to pay any premium at all. Our correlation results also indicate that in order of strength, '*knowledge of green buildings', 'income levels', 'environmental concern', ''education level' and 'age'* are most correlated with WTP. We found significant variations across education levels, with the more educated willing to pay higher premiums. Income levels were also found to impact WTP, much like the findings of Hu et al. (2014). Our findings highlight steady increases in WTP as income levels rise, particularly for earners above GH₵6,000 per month. In contrast with lower levels of income who are willing to pay between 6% - 10% on average, the highest earners are willing to pay between 11% and 15%. Environmental concern levels also exhibit a positive relationship with WTP, notably

beyond the point just *somewhat concerned.* Respondents who were unconcerned, slightly concerned or somewhat concerned about the climate are only willing to pay up to 5% for green buildings, while those moderately or extremely concerned are willing to pay between 6% and 10%. These findings align with those of Attaran & Celik (2015) who suggested that environmental responsibility impacts WTP.

In response to calls for further sensitization efforts to boost the uptake of green buildings in developing countries such as Ghana (Anzagira et al., 2019), we found significant variances in WTP across knowledge levels. Respondents who had never heard of green buildings were not willing to pay beyond 5% over conventional buildings. As knowledge levels increased, WTP levels also increased, and those who identify as experts indicate a willingness to pay the highest premiums (between 11% and 15%). Much like Ofek & Portnov (2020), we conclude that knowledge levels heavily impact WTP a premium for green buildings, making this a key consideration in efforts to boost their adoption in Ghana.

No studies based in Ghana have attempted to gauge the willingness of the populace to pay a premium for green buildings, and how this willingness varies across different characteristics such as age, gender, income levels and education levels. To the best of our knowledge, this study represents the first attempt to address this gap by investigating the willingness of Ghanaians to pay a premium for green buildings. Based on our final sample of 995 respondents, we also computed significant differences in WTP due to differences in Income, knowledge levels, climate concern levels and benefit awareness. These findings offer a clear signpost for all stakeholders of green buildings and highlight that poor awareness levels have a detrimental impact on the WTP a premium, a fact that is stagnating their potential adoption. Additionally, these results should provide investors and developers some confidence in entering the green building space, knowing that there is a potential market for green buildings in Ghana, albeit under certain conditions.

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WILLINGNESS TO PAY FOR GREEN BUILDINGS IN GHANA: THE IMPACT OF BENEFIT SENSITISATION

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Abstract

Global discourse on sustainable construction has aroused great interest in the need for green building proliferation as a strategic means to reduce the environmental harms of conventional buildings. However, green building adoption remains laggard in Ghana as individuals are unwilling to pay extra for green buildings. Researchers have made many recommendations to enhance willingness to pay, recurrent amongst which is benefit sensitisation. However, the impact of benefit sensitisation, especially in the Ghanaian market, remained unproven and unquantified. This study provides clarity to the issue by investigating and quantifying the impact of an undertaken green building benefit sensitisation on the willingness to pay of 630 participants who were unaware of the individual-level benefits of green buildings. The study confirmed a significant impact of benefit sensitisation on willingness to pay for green buildings. After benefit sensitisation, respondents who were initially only willing to pay up to a 5% premium became willing to pay an average of 6 - 10% premium; with only 14.8% of respondents maintaining an unwillingness to pay extra for green buildings.

KEYWORDS

Sustainability, Green building, Willingness to Pay, Benefit Sensitization, Ghana

1.0. Introduction

Global discourse on sustainable construction has aroused great interest in green buildings and the need for its proliferation as a strategic means to reduce the negative environmental impacts of construction while improving human comfort and health (Ofek and Portnov, 2020; World GBC Annual report, 2021). Green buildings are structures that are created using processes that are environmentally responsible and resource efficient throughout their life cycle from design, construction, operation, maintenance, renovation, to deconstruction (US EPA as cited by Sinha, Gupta and Kutnar, 2013; Hu, Geertman and Hooimeijer, 2014; Zalejska-Jonsson, 2014; Ofek and Portnov, 2020; Rosner, Amitay and Perlman, 2022). Green building is therefore the status of efforts to integrate sustainability in construction practices (Sinha, Gupta and Kutnar, 2013).

Green buildings are designed to exhibit a high level of environmental, economic and engineering performance including energy efficiency, improved indoor air quality, resource and material efficiency, and users' health and long-term productivity among others (Chatterjee, 2009; Retzlaff, 2009). Green construction is a great tool to facilitate growth while simultaneously reducing climate change impacts, hence the production of green buildings is an opportunity especially for developing countries to leapfrog to sustainable built environments (Tukker, 2005; World Green Building Council, Report, 2021). The importance of green buildings has warranted attention and increased efforts towards sustainable construction from governments and building experts globally (World Green Building Report, 2021).

Though green buildings have a significant positive impact on the environment and human health, green buildings are often more expensive than conventional buildings because green building price premium tends to cover extra costs such as investment in research and development, and more efficient, but more expensive, construction systems (Ofek and Portnov, 2020). Therefore, for green buildings to gain ubiquitous traction, consumers' must be willing to pay these additional costs.

However, as evident from the low demand for green buildings in Ghana (Darko, Chan, Gyamfi, *et al.*, 2017; Chan *et al.*, 2018; Darko and Chan, 2018; Darko *et al.*, 2018; Anzagira, Badu and Duah, 2019; Guribie *et al.*, 2021), Ghanaian consumers do not seem willing to bear the premium. Many recommendations have been made by researchers to enhance willingness to pay, chief amongst which is benefit sensitisation (Attaran and Celik, 2015; Ofek and Portnov, 2020; Takuh, Abang and Akinyemi, 2021). Studies on the impact of benefit sensitisation in

Ghana have however shown varying results. Whereas research has observed a significant impact on green building adoption (Darko and Chan, 2018), another has shown an insignificant impact (Darko *et al.*, 2018).

This study seeks to provide clarity to the issue by investigating and quantifying the effect of benefit awareness on willingness to pay for green buildings. To the best of our knowledge, this study is the first in Ghana directly investigating this phenomenon and will provide reference for further green building studies and policy design. The cruciality of this study is further buttressed by the request of Anzagira, Badu and Duah (2019) for research geared towards the early proliferation of green buildings in Ghana.

2.0. Benefit Sensitisation And Willingness To Pay For Green Buildings

In many studies, a lack of individuals' awareness of green buildings has been highlighted as the most significant impediment to green building adoption (Mohamad Bohari *et al.*, 2016; Azeem *et al.*, 2017; Nguyen *et al.*, 2017; Guribie *et al.*, 2021). This lack of green building knowledge has also been found to constitute significant inertia to individuals' willingness to pay a green premium (Golbazi, Danaf and Aktas, 2020; Ofek and Portnov, 2020; Takuh, Abang and Akinyemi, 2021; He, Liu and Li, 2022). As Njo, Valentina and Basana (2021) put it, limited knowledge on green buildings contributes to individuals avoiding risks of purchasing or investing in green property.

Against this backdrop, studies have recommended and continue to recommend green building awareness creation as solution to enhancing individuals' willingness to pay for green buildings (Attaran and Celik, 2015; Ofek and Portnov, 2020; Takuh, Abang and Akinyemi, 2021; Lawluvy, Ntim and Ahiadu, 2022), and ensuring green building proliferation (Zhang *et al.*, 2016; Darko, Chan, Ameyaw, *et al.*, 2017; Darko and Chan, 2018; Oyewole and Komolafe, 2018b; Abraham and Gundimeda, 2020; Oyewole, Komolafe and Gbadegesin, 2021; Takuh, Adeyemi and Bello, 2021). When awareness is created on green buildings, individuals will be more likely to pay a higher green building premium, thereby encouraging larger investments in green buildings (Oyewole and Komolafe, 2018a; Oyewole, Komolafe and Gbadegesin, 2021).

Yet, general green building awareness creation may not be enough to spur adoption as

different contents of information provided during publicity have been found to have different impacts on willingness to pay (He, Liu and Li, 2022). Though information on environmental impact of green buildings has been found to enhance willingness to pay (Zhao *et al.*, 2015), many studies suggest personal benefits such as cost savings (Agyekum *et al.*, 2019; He, Liu and Li, 2022) and living comfort (Zhang *et al.*, 2016) to have the highest impact on willingness to pay (Zhang *et al.*, 2016; Agyekum *et al.*, 2019; Abraham and Gundimeda, 2020; He, Liu and Li, 2022). Thus, even if individuals are made aware of green buildings and their positive impacts on the environment, they may only be willing to pay a higher premium when this information translates into personal benefits such as lower water and electricity bills (Abraham and Gundimeda, 2020).

A few studies have investigated and quantified the impact of benefit awareness on willingness to pay for green buildings. In China, He, Liu and Li (2022) found most respondents willing to largely increase their willingness to pay for green buildings after being informed of the benefits of green buildings. In Israel, Ofek, Akron and Portnov (2018) found more benefit-informed consumers willing to pay about 30% more for green buildings than less informed consumers. In Pakistan, Khan, Thaheem and Ali (2020) prove that green building benefit awareness significantly increases willingness to pay for green buildings. Their study (Khan, Thaheem and Ali, 2020) found about 7% of respondents willing to pay more for green buildings upon being made aware of the benefits, in addition to the 63.7% of respondents who were already willing to pay more for green buildings. Based on these findings, it becomes clear that benefit sensitisation, a strategy that is already being adopted by Governments of developed countries (Darko and Chan, 2016), significantly influences willingness to pay a green premium and is urgently needed for the proliferation of green buildings in the developing world (Oyewole and Komolafe, 2018b).

In Ghana, many individuals are still oblivious to the benefits associated with green buildings (Darko *et al.*, 2018). Guribie et al. (2021) found this lack of green building knowledge to be the most significant hindrance to green building demand in Ghana. This is in line with the findings of Darko & Chan (2018) who found increasing publicity to be the most significant strategy to enhance green building adoption in Ghana.

To catalyse green building adoption, drawing from Rogers' diffusion of innovation theory, Guribie et al. (2021) call for better communication of the relative benefits of green buildings over conventional alternatives to the Ghanaian populace. Their recommendation (Guribie *et al.*, 2021) echoes Anzagira, Badu and Duah's (2019) direction that, a national green building awareness campaign should be undertaken to conscientize the Ghanaian populace about the

benefits of building green and their roles in green building adoption. Anzagira, Badu and Duah's (2019) add that, green building sensitisation should commence at the basic levels of education through to tertiary institutions, so as to develop a green-oriented future generation.

There is however a discord between research on the impact green building benefit sensitisation will have in the Ghanaian market, as Darko et al. (2018) found no significant link between awareness and green building adoption. According to Darko et al. (2018), this finding might be due to their observation that government related factors are most important to promote green building adoption. Yet, this raises an unclarity that must be clarified by empirical evidence.

3.0. Methodology

This research adopted an exploratory research design to investigate the impact of green building benefit sensitisation on the willingness to pay a green premium in Ghana's property market.

The respondents for this study were sampled by distributing an online survey to as many willing respondents as possible across all regions of Ghana. To provide a demographic overview of responses, the first section enquired about respondents' age, gender, highest education level, income level, and region of residence. The next section focused on the willingness of respondents to pay a premium for green buildings by asking them how much premium they were willing to pay for a green building over a conventional building. The respondents were given seven (7) levels of premium to choose from – *'no premium'* to *'above 25%'*. Following this initial test of their willingness to pay a premium, respondents were presented with well-established benefits of green buildings and asked if they were already aware of them. These benefits being: *"A green building can save over 10 times the extra costs of building green by providing the following benefits: Lower electricity bills, lower water bills, lower maintenance costs, improved health, and improved productivity"* (Kats, 2003; Ries *et al.*, 2006). Respondents who indicated that they were previously unaware of these benefits were then given the option of changing their earlier response on how much premium they are willing to pay for a green building.

The survey instrument was pilot-tested, and the necessary changes were made before the final survey. Respondents were assured of their anonymity and the confidentiality of their responses. Additionally, reminders were regularly sent to ensure an optimum response rate. While 1,872 viewed the questionnaire, only 1,227 responded. Two hundred and thirty-two of

the responses were incomplete and thus removed from the final sample before the analysis. In order to test our hypothesis that benefit sensitisation impacts the willingness to pay a premium, only responses from individuals who had no prior knowledge of the stated benefits were selected for further analysis. In the end, six hundred and thirty (630) were sampled for further analysis.

Table 46 presents the profiles of our final respondents.

Table 46: Profile of Respondents

Variable	Scale	Frequency	Percentage
Age	Below 20	17	2.7%
	20 - 25	181	28.7%
	26 – 30	185	29.4%
	31 – 35	78	12.4%
	36 – 40	44	7.0%
	41 – 45	47	7.5%
	46 – 50	28	4.4%
	51 – 55	23	3.7%
	56 – 60	12	1.9%
	Above 60	15	2.4%
Gender	Male	336	53.3%
	Female	294	46.7%
Education Level	Junior High School	3	0.5%
	Senior High School	53	8.4%
	BSc equivalent	411	65.4%
	MSc equivalent	142	22.6%
	PhD	21	3.3%
Monthly Income	No income	138	22.1
	GH₵ 1 – GH₵ 1,499	128	17.5%
	GH₵ 1,500 – GH₵ 2,999	158	24.1%
	GH₵ 3,000 – GH₵ 4,499	75	13.8%
	GH₵ 4,500 – GH₵ 5,999	32	6.8%
	GH₵ 6,000 – GH₵ 7,499	26	5.4%
	GH₵ 7,500 – GH₵ 8,999	18	3.5%
	Above GH₵ 9,000	55	8.9

Tests of reliability were performed before our final analysis, and Cronbach's alpha for the scales adopted for this study was 0.864. This alpha value was deemed acceptable in line with the extant literature, which establishes a value above 0.7 as proof of scale reliability (Li, Long and Chen, 2018)

4.0. Results and discussion

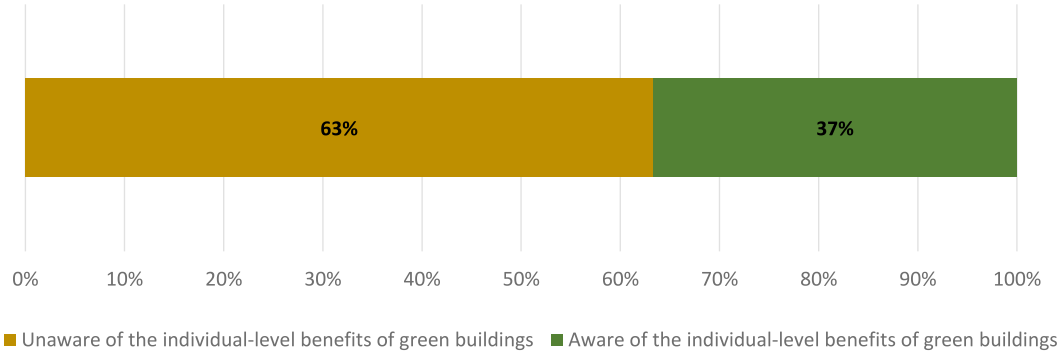

Figure 11: Awareness of individual-level green building benefits

Out of 995 complete responses, only 365 respondents (37%) were aware of the individual-level benefits of green buildings presented in the survey. This evidences the assertion by Darko et al. (2018) that many Ghanaians are still oblivious to the individual-level benefits associated with green buildings.

Pre-sensitisation responses suggested a reluctance to pay high premiums for green buildings. Approximately a third of respondents (35.4%) were unwilling to pay any premium at all. The biggest proportion (36.6%) was willing to pay, albeit only up to 5% extra for a green building. Participants were more reluctant to pay a premium above 10%, with only 11.8% inclined to pay above 10% over a conventional building. On average, Ghanaians who are unaware of the cost-saving benefits of green buildings are willing to pay no more than 5% as a premium for green buildings. Compared to the global average cost surcharge of 7% incurred in building green (Hu and Skibniewski, 2021), the premium benefit-unaware Ghanaians are willing to pay is too low to sustain green building proliferation.

After the initial willingness of respondents to pay a premium was tested, the stated benefits of green buildings were presented. To gauge the impact of our sensitisation exercise, respondents were then given the opportunity to change the premiums they would be willing to pay. The impact of benefit awareness was immediately apparent: the percentage who were unwilling to pay a premium dropped from 35.4% to 14.8%. The biggest proportion

(32.2%) were still willing to pay up to 5%, even after benefit sensitisation. Beyond this point, benefit awareness saw a minor improvement in the proportion who were willing to pay a 6% - 10% premium *(from 16.2% to 19.8% of respondents)*.

After previously highlighting a reluctance to pay premiums above 10% before sensitisation, we recorded a significant shift in attitude. As opposed to the 11.8% respondents who were willing to pay an above 10% premium prior to sensitisation, this proportion increased to 33.2% after they were educated on these benefits. Much like most past studies (Golbazi, Danaf and Aktas, 2020; Ofek and Portnov, 2020; Takuh, Abang and Akinyemi, 2021; He, Liu

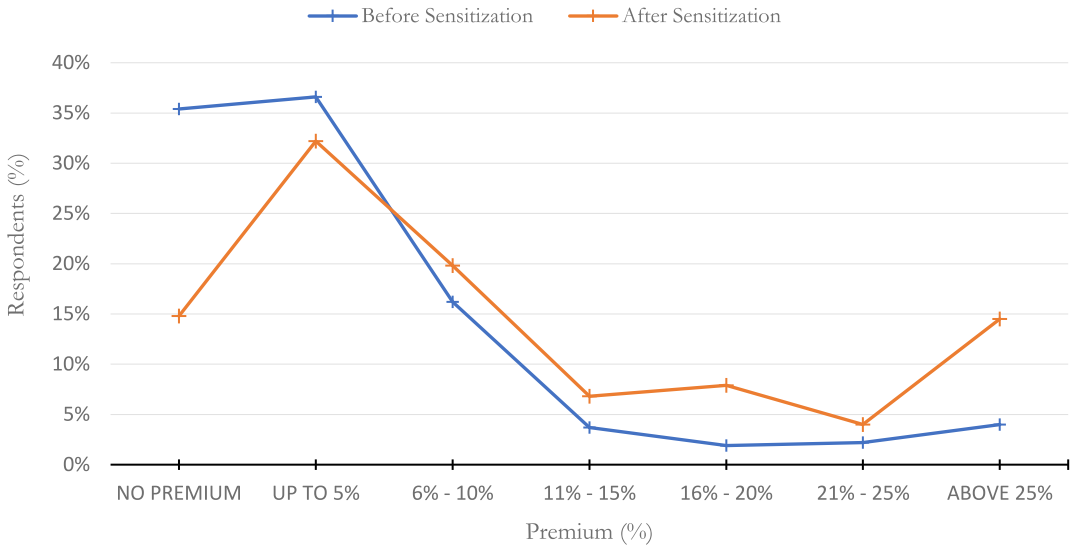

Figure 12: Willingness to Pay a Premium: Before and After Sensitisation

and Li, 2022), we found a direct correlation between knowledge of green buildings and the willingness to pay for them. The highest premium (above 25%) also saw increased levels of willingness, from 4.0% to 14.5%. Figure 12 graphically illustrates the premiums respondents were willing to pay before and after benefit sensitisation (This is further detailed in Table 47).Additionally, we observed that benefit-aware Ghanaians were generally willing to pay higher premiums, at an average of 6% to 10%. The impact of sensitisation is made obvious by comparing the means pre- and post-sensitisation. Prior to sensitisation, unaware respondents were willing to pay an average of 2.23, represented by the range *'up to 5%'* on our Likert scale. Following sensitisation, the same respondents, now benefit-aware, were willing to pay on average 3.2, which represents the range *'6% - 10% '*.

Table 13: Willingness to Pay a Premium: Before and After Sensitisation

	Before Sensitisation		After Sensitisation	
Premium Levels	***Frequency***	***Percent***	***Frequency***	***Percent***
Not willing to pay	222	35.4%	93	14.8%
Willing to pay up to 5%	230	36.6%	203	32.2%
Willing to pay 6% - 10%	102	16.2%	125	19.8%
Willing to pay 11% - 15%	23	3.7%	43	6.8%
Willing to pay 16% - 20%	12	1.9%	50	7.9%
Willing to pay 21% - 25%	14	2.2%	25	4.0%
Willing to pay above 25%	27	4.0%	91	14.5%

Furthermore, based on the average cost surcharge of 7% incurred by building green (Hu and Skibniewski, 2021), the average willingness to pay of 6%-10% observed post sensitisation is sufficient to ensure green building proliferation. This highlights the significant role green building benefit sensitisation plays towards the proliferation of green buildings.

5.0. Conclusion

Low green-building benefit awareness has been identified as a significant factor inhibiting consumers' willingness to pay for green buildings (Golbazi, Danaf and Aktas, 2020; Ofek and Portnov, 2020; Takuh, Abang and Akinyemi, 2021; He, Liu and Li, 2022). In Ghana where there is a dearth of demand for green buildings (Djokoto, Dadzie and Ohemeng-Ababio, 2014), benefit sensitisation has been recommended as a solution to promoting individuals' willingness to adopt green buildings (Anzagira, Badu and Duah, 2019). Yet, the effect that such sensitisation would have on willingness to pay and green building adoption remained unclear and unevidenced.

To provide evidenced clarity, we undertook a green building benefit sensitisation experiment and measured the impact of said sensitisation on participants' willingness to pay for green buildings. Since we only sought the impact of benefit sensitisation on individuals who had no prior knowledge of the benefits of green buildings, the research filtered out 365 participants who were already aware of the individual-level benefits of green buildings from a total of 995 willing participants. This revealed our first finding: only 37% of respondents were aware of the individual-level benefits of green buildings. This finding agrees with the assertion by Darko et al. (2018) that there exists a high number of Ghanaians without knowledge of green

building benefits.

Next, the research found a significant increase in willingness to pay for green buildings post-sensitisation. After benefit sensitisation, respondents who were initially only willing to pay an average of up to a 5% premium became willing to pay an average of 6% - 10% premium; with only 14.8% of respondents maintaining an unwillingness to pay a green premium. This result heralds that benefit awareness of green buildings plays a crucial role to its wide-spread adoption by significantly augmenting the number of consumers willing to pay for green buildings.

The research further evidenced that, the impact of benefit sensitisation could be sufficient to spur the proliferation of green buildings in Ghana and as such warrants urgent attention and investment. This required attention should be manifested through policies and strategies geared towards green building benefit awareness campaigns. In this regard, the study provides a first point of action and reference frame for policy makers in Ghana and other African countries in the design and implementation of policies and measures towards green building benefit sensitisation as an efficient means of ensuring the sustainability of the built environment. Accordingly, the findings of this research also provide green building investors, developers, and other market stakeholders with valuable insight for tapping into as well as navigating the huge potential market for green buildings.

The significance of this study is further highlighted by its contribution to the inadequate body of literature on demand-side drivers of green building adoption in Sub-Saharan Africa (Anzagira, Badu and Duah, 2019; Guribie *et al.*, 2021; Oyewole, Komolafe and Gbadegesin, 2021). Additionally, the study is the first to evaluate the impact of benefit awareness on consumers' willingness to pay for green buildings in Ghana, therefore will serve as a grounding for further research.

This study has limitations worth stating with regard to the recruitment of the sample. By employing a non-probability sampling technique and an online survey distribution system, the results of this study may not be statistically generalisable to represent the entire Ghanaian population. The research however sought to overcome this limitation by adopting a large sample size. Furthermore, this possible generalisability limitation does not tarnish the validity of results as the study sought primarily to provide insight into an area not clearly defined, and not specifically to provide generalisable results.

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HOW ABOUT A HOUSING AND TRANSPORTATION AFFORDABILITY INDEX IN GHANA? - A SYSTEMATIC REVIEW

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Abstract

Purpose - Although the largest proportion of the household budget is spent on housing and transportation (H+T), housing affordability estimates in Ghana have over the years treated housing as a mutually exclusive expenditure, thereby excluding the effects of transportation costs. This can result in under-reporting of the household burden, which ultimately affects planning and policymaking. To curtail under-reporting, the H+T affordability index incorporates transportation costs into the assessment of housing affordability. However, the H+T affordability index is yet to be explored in the real estate literature from Ghana. This study contributes a novel discussion of the H+T affordability index and how it can be applied in Ghana.

Approach - Based on a systematic review of 9 peer-reviewed papers on the H+T affordability index, the main variables employed, the lessons, and policy implications have been discussed towards having a modified H+T affordability index that is suitable for Ghana.

Findings - Generally, the addition of transportation costs to the housing burden significantly changes the dynamics of the housing burden. Besides, the H+T Affordability Index relies on accessible secondary H+T economic data. In cities where there is a low proportion of renters, the owners' equivalent rent is used as the rental value. The main variables and methodologies employed in past studies have been discussed.

Research implications - Our research calls for researchers and real estate professionals in Ghana to consider developing robust housing, trip, spatial, and neighborhood databases to foster future H+T studies.

Practical implications - This study contributes insights that can enhance debates on the H+T

affordability index toward improved measurement tools for the household burden in Ghana.

Originality/Value of work - This study is the first attempt to discuss how the H+T affordability index can be applied in Ghana's housing market.

Keywords - Affordable housing; Affordable transportation; Transportation spending; H+T affordability index; Housing burden; Ghana

Paper Type – Research paper

1.0. Introduction

Housing and transportation (H+T) is the largest household expenditure and essential factor in urban planning and policymaking. The H+T costs play a major role in decisions regarding residential location and choice of transport. Due to rapid population growth and urban sprawl, it is imperative to have robust policies and plans to ensure affordable H+T in cities. Housing, being the biggest consumer of household income, is considered affordable if it falls below 30% of annual income —''(Nepal et al., 2010; Agrawal et al., 2020; Aljoufie & Tiwari, 2020). On the other hand, transportation spending, consisting of all travel costs on private car usage and public transport is the second-highest household expenditure and accounts for 12-15% of total household income (Ferdous et al., 2010; Guerra et al., 2018). Thus, the joint H+T burden is an important measure of the quality of life. It is also strongly associated with the Sustainable Development Goals 3 (*Good Health and Wellbeing*), 8 (*Decent Work and Economic Growth*), and 11 (*Sustainable Cities and Communities*).

Generally, affordable housing has been measured by treating housing costs as mutually exclusive, thereby excluding the impact of transportation costs (Boamah, 2010; United Nation-Habitant, 2011; Akingbohungbe & Baba, 2014; Awanyo, & Attua, 2016; Asante et al., 2018). However, several studies have proven that housing and transportation have a strong relationship. The cost of housing declines as residents stay further away from the nucleus of the city (Mattingly & Morrissey, 2014) and the transportation costs tend to increase for the same residents (Currie et al., 2010). Rahman et al. (2021) found in Khulna (Bangladesh) that the exclusion of transportation attributes from residential housing rental models, reduced the model performance by 3.1%. In Semarang and Kendal (Indonesia), it was found that the most influential factors influencing the community's selection of subsidized houses were accessibility and choice of transportation modes (Indriyanti et al., 2020). In Tehran, Iran, it was found that the operation of a new metro station resulted in an average 3.7 percent

increase in the prices of adjacent properties **(Yazdanifard et al., 2021)**.

Consequently, several studies have voiced the need to discuss housing affordability in tandem with transportation spending (Jewkes & Delgadillo, 2010; Mattingly & Morrissey, 2014; Hamidi & Ewing, 2015; Hamidi et al., 2016). The H+T has been premised on the basis that a house available for a lower price is not affordable in reality if it is located in an area with less accessibility, and if the transportation costs are higher. These findings emphasize the need to rethink housing affordability estimation by adding transportation costs. Accordingly, the H+T Affordability Index was developed by the United State of America's Center for Neighborhood Technology in 2006 (Haas et al., 2006) and improved in 2012 (CNT, 2012) to serve as a blueprint for measuring H+T.

The H+T spending is very critical in Ghana, where the household size is large (Beaman & Dillon, 2012), salaries are relatively lower than in other parts of the world, and transportation spending keeps increasing '—'(Primrose & Christopher, 2018). Besides, the formal sector is smaller compared to the informal sector and minimum wages are relatively lower than in developed economies et al., 2021). These conditions make H+T spending burdensome, ultimately affecting the quality of life, happiness, and subjective wellbeing (Diaz Olvera et al., 2008; Venter & Behrens, 2005). Consequently, households are likely to make little savings, unable to meet other household needs, and have a low standard of living. It is imperative to add transportation costs to housing affordability estimates to give policymakers a better understanding of the housing burden in Ghana.

As far as we are concerned, the H+T affordability index is yet to be explored in Ghana. Considering the benefits that it can bring to both research and practice by giving reliable housing burden estimates, it is imperative to develop an H+T affordability index for Ghana by modifying its applications to fit the Ghanaian housing market. This will largely depend on scientific evidence, especially given the relative difficulty in accessing secondary data in Ghana as pertains to other regions (Berg et al., 2017; Diaz Olvera et al., 2008). A systematic literature review would enable researchers and practitioners to learn some lessons for onward debate and policy in Ghana (De Vos & El-Geneidy, 2022).

Therefore, this study is a systematic review of selected papers that have used the H+T affordability index. This systematic review is guided by the following research questions. (1) What are the main variables employed in previous studies, their strengths and weaknesses? (2) What are the lessons and policy implications that can be employed to modify an H+T affordability index in Ghana? The findings are expected to enhance debates on housing affordability estimation and strengthen policymaking in Ghana.

2.0. H+t Affordability Index

Ferdous et al. (2010) proposed the need to treat housing and transportation affordability together. Subsequently, the H+T Affordability Index, developed by the United State of America's Center for Neighborhood Technology, provides comprehensive coverage of affordability that includes variables related to the cost of housing and the cost of transportation at the neighborhood level (CNT, 2012). Then, Mattingly and Morrissey (2014) made a strong case for H+T in their study from Auckland, New Zealand. Hamidi and Ewing (2015) followed the advocacy through their study from the USA. This index came about after criticisms of the previous housing affordability indices that neglected transportation costs (Mattingly & Morrissey, 2014; Saberi et al., 2017). According to the index, H+T is affordable when it is not more than 45% of household income.

In Ghana, residents staying at the fringes rely more on private-owned transport services and paratransit. This results in increased travel costs, travel time, and trip distance. These factors ultimately affect the housing decisions of residents. Therefore, overlooking the cost of transportation and focusing on housing affordability can affect planning and policy-making. It is imperative to rethink housing affordability by adding transportation costs in Ghana.

3.0. Methodology

To put forward a policy agenda, we did a systematic literature review of previous H+T studies. The procedures and reporting for this study followed the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines (Moher et al., 2009). In the first step, paper inclusion and exclusion criteria were developed. The second step was paper identification in the Web of Science (WoS) and Scopus. All the top transportation and urban planning journals are indexed in these databases '"(Mongeon & Paul-Hus, 2016). Other databases such as Google Scholar and ProQuest were searched.

Selected papers met the following inclusion and exclusion criteria. The scope of the study was restricted to peer-reviewed Journal Articles, Review Articles, and Conference papers written in the English language. Selected papers had at least one of the following keywords in their titles: housing and transportation*, housing and transportation spending*, housing and transportation index*, and housing and transportation affordability*. Thus, papers merely covering housing burden, housing affordability, and housing rents without the transportation nexus were excluded. All selected papers explicitly included an H+T model, and not just

housing or transportation variables were estimated. In addition, papers were restricted to publications covering 2006 and 2022 because the development of H+T has evolved within this period. Paper identification was done in the WoS and Scopus using the search criteria as shown in Figure 1.

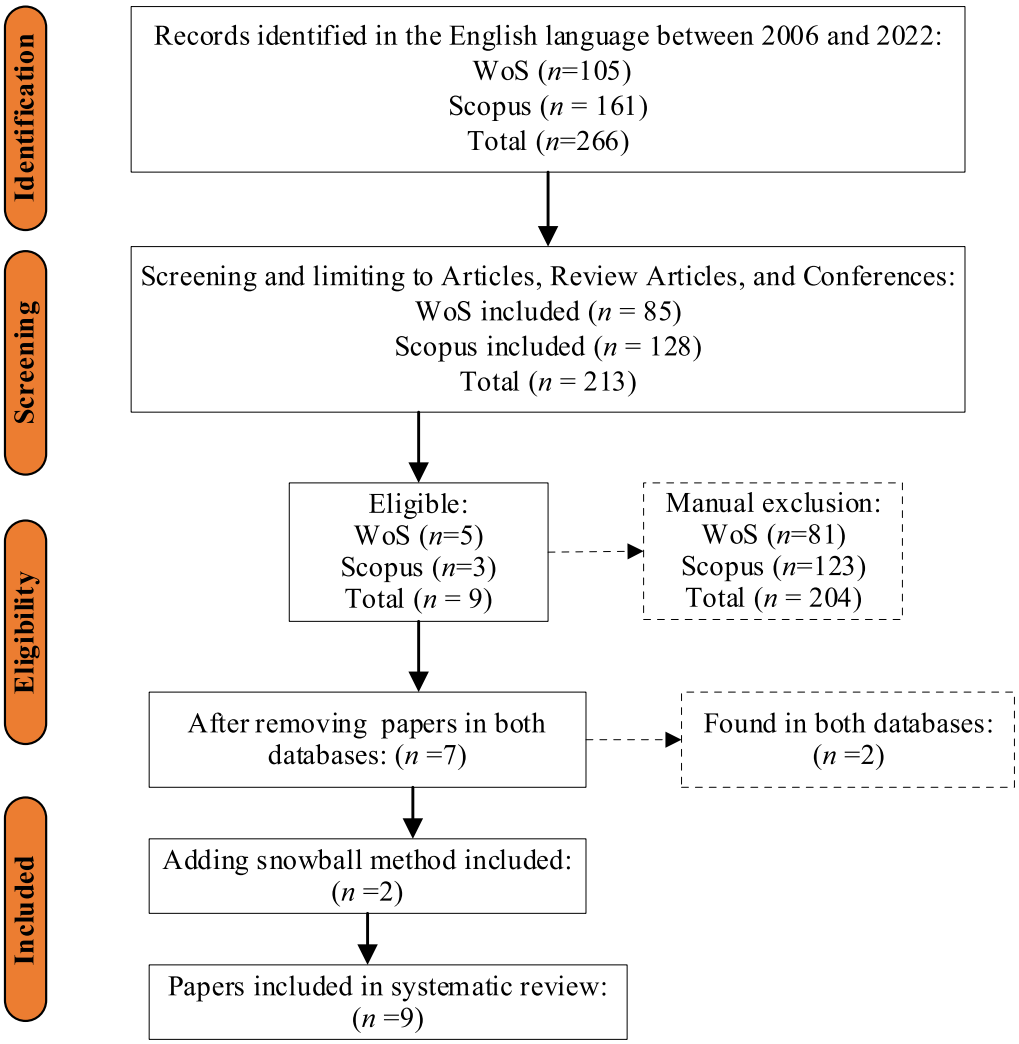

Figure 1: PRISMA flow chart for the data collection

After searching both WoS and Scopus, the datasets were retrieved in excel format followed by manual exclusion of duplicate papers. Overall, 9 papers were eligible but two duplicates were deleted giving an output of 7 papers. The snowball method was employed whereby the bibliographies of the selected papers were searched to find papers that met the selection criteria but were excluded (*n*=2). Thus, the total number of selected papers was 9.

4.0. Results

4.1 Overview of selected papers

Table 1 gives an overview of the nine papers found in the data collection. Geographically, there were two papers from South America, Oceania, the Middle East, and North America, and one from the Asia Pacific. The data composition of studies was mainly household surveys, national census data, and secondary institutional data. Additionally, these H+T studies focused largely on large cities, indicating that the H+T burden is perceived to be more critical in these urban areas than in other smaller cities with relatively lower population sizes. The main methods used in case studies included modified H+T affordability indices, the global Moran's index, owners' equivalent rent model, interval data envelopment analysis, ordinary least squares, and the linear mixed-effects models.

Coulombel (2018) proposed a monocentric household utility maximization model which in addition to the H+T affordability estimation, compares the relationship between H+T and the welfare of households. It makes a bold assumption that all jobs are located in the Central Business District. Thus households commute to the CBD or the same neighborhood, and their commuting cost increases as they stay farther from the CBD. This is however yet to be tested with a case study dataset.

Table 1: Overview of H+T studies

Reference	Country	City	Method	Data (sample size)
Isalou *et al.*, 2014	Iran	Masoumyeh and Pardisan New Town, Qom	A simplified H+T affordability index	Household survey (900)
Mattingly and Morrissey, 2014	New Zealand	Auckland	The Combined H+T affordability index	New Zealand census and other open data sources
Saberi *et al.*, 2017	Australia	Melbourne	H+T Affordability Index	Open data sources
Acolin and Green, 2017	Brazil	São Paulo	Owners' Equivalent Rent (OER) Model	Annual population survey (8000) housing units
Guerra, 2018	Argentina	Greater Buenos Aires	Ordinary Least Squares (OLS)	Household travel survey (22,170)
Coulombel, 2018	United States of America	none	Proposed a household utility maximization model	No data was tested

4.2 Income, housing, and transportation variables

The first objective of this systematic review is to identify the main variables that studies have used to measure the joint H+T burden. The H+T affordability index assumes the simplified equation below. It simply adds the housing plus transportation costs of households (means or medians) as a percentage of the household income. To solve this model, the main sources of data identified are household surveys, census data (open source), and secondary institutional data.

$$H + T_{ai} = \left[\frac{(HC+TC)}{I}\right] \times 100 \quad \text{..... (1)}$$

Where: $H + T_{ai}$ is the housing and transportation Affordability Index, *HC* is monthly housing costs, TC is monthly transportation costs, and I is the monthly income.

Apart from one study (Mattingly & Morrissey, 2014) where the median monthly income was adopted, other studies used the mean monthly income based on sampled households. This was premised on the polycentric form of the studied city (Auckland) where the topography necessitated a division of the city into several land use and population density zones. When the city has several distinct cultural, spatial, and economic features, the median income is preferred to prevent biases.

From the simplified equation, the fulcrum of studies has been the valuation of the housing and transportation variables. Household-level data on monthly income is easy to obtain either by surveys or using secondary data. The following sub-sections give insights on the separate housing and transportation cost valuation based on the previous studies.

4.2.1 *Housing cost valuations*

The housing markets in different countries have dissimilarities and this is an important consideration in affordable housing estimates. In Iran where the majority of the population are renters, housing affordability was measured using monthly rental equivalents. Housing expenses including mortgage payments, maintenance costs, and taxes among others were scaled-up into monthly rent (Isalou et al., 2014). In Brazil, only 17.9% of the population were renters so house owners' expenses such as tenure, monthly rent, wall and roof maintenance, bathroom, electricity, water, sewage, and garbage collection were all valued to obtain a monthly rent equivalent (– Acolin & Green, 2017). However, this approach has some disadvantages. Researchers do not have the time and permits to vet all housing purchase agreements and mortgages to know the terms and conditions. The conditions regarding tenure, sewage, maintenance, garbage, and electricity bills may vary among the households

used in the studies. Thus, to use this approach, it is expected that researchers and practitioners make some reasonable assumptions and clustering to control for these variations.

To control for this, the majority of studies used the market rental values or the real rents that tenants pay monthly or annually other than using the owners' expenditures '(Mattingly & Morrissey, 2014; Saberi et al., 2017; Guerra et al., 2018; Aljoufie & Tiwari, 2020). This approach has also been criticized to have some subjectivity when data is solicited as a survey since the sincerity of respondents is not assured. Nonetheless, it makes valuation easier since the raw data can be run in models. Consequently, other studies used both the monthly rents of tenants and the owners' monthly rent equivalent '(Dewita et al., 2020; Schouten, 2021). Due to the disadvantages of both the real rents and the owners' rent equivalent, they can have separate models in the evaluation of affordability.

Thus generally, the housing affordability component of the H+T comprises variables such as homeownership status, mortgage repayments, rent payments, electricity, water, sanitation bills, maintenance costs, taxes, owner's equivalent rent, and average or median property prices. 'Dewita et al. (2020) emphasized the need to consider the residential density, distance from the city center, housing type (number of bedrooms), development type (self-owned or estate housing), and the type of tenure in estimating the housing costs. These findings show that the distinct spatial, neighborhood, and socio-economic characteristics of the Ghanaian cities would require consideration when adopting an H+T model in light of the unique characteristics of Ghana's real estate market.

4.2.2 *Transportation cost valuations*

The transportation cost estimates also have complex dissimilarities. Typically, residents are either owning a private vehicle or travel by public transport. Besides, there are different types of privately owned vehicles and public transport modes which have divergent maintenance costs and lorry fares. Thus, affordability may vary depending on vehicle ownership, type of vehicle ownership, exiting transport modes, and preferred transport modes. Affordable transportation is thus calculated based on specific assumptions and city contextualization. So far, all studies have included the costs borne by private vehicle owners and non-vehicle-owners but these were ultimately aggregated, hence the actual transportation burden of these two categories remains unrevealed. The solution for this is to have different models for these two categories. However, it should be noted that these would require extensive secondary data.

For private vehicle owners, the transportation variables commonly used include as average

number of vehicles per household, number of trips generated per day, trip distances, vehicle costs (fuel, parking, maintenance cost) per duration, tolls, and taxes. Regarding non-vehicle-owners, the common variables are public transportation zoning, transport fares for different transport modes, transport modal shares, trip distance, and the number of trips. In light of the effects that the purpose of a trip can have on modal choice, trips to work, school, shopping, recreation, and visiting friends may vary. Therefore, some housing surveys or censuses collected data about the purpose of trips (Isalou et al., 2014; Mattingly & Morrissey, 2014; Saberi et al., 2017).

5.0. Lessons and policy implications for the ghanaian context

So far this review has covered papers published outside Ghana. However, the findings and lessons can lead to potential exploratory and empirical studies in Ghana and other African countries. Based on the review of variables and methodologies, this section discussed critical lessons and policy implications for real estate planners, managers, and researchers in Ghana.

It is evident from previous studies that both the housing and transportation components rely on secondary and spatial data. To assess the H+T affordability in Melbourne, Saberi *et al.* (2017) relied on several data sources including the Department of Transport, Planning and Local Infrastructure, Australian Prudential Regulatory Authority, and Public Transport Victoria. Even when surveys were used, some datasets such as trip distance and time, mortgage payments, and modal share were solicited from relevant institutions. For example, it requires GPS technology to ascertain the travel distances and trajectories of journeys in a neighborhood. Similarly, trip distance and costs would need documentation. In Brazil, large databases of survey data were also employed through annual household surveys (–Acolin & Green, 2017). This means besides the decade after decade housing census, annual state-funded data collection can help to build this proposed open-source databases which would be very useful. These are major issues to be considered in Ghana where secondary open-source data is scarce, difficult to obtain, and sometimes unavailable (Ajayi et al., 2021; Yanocha, Mason & Hagen, 2021). At the moment the majority of affordable housing studies from Ghana have relied on surveys that lack these datasets. Although these are valid approaches future studies can be enriched with institutional income, housing, and transportation data. Therefore, to adopt a modified H+T in Ghana, research institutions must make efforts at creating open-source databases to support researchers and practitioners. Databases are the engine room for quantitative evaluations and impactful policies.

The housing market in Ghana is dominated by the private sector. Consequently, several transaction and tenancy agreements may go undocumented. It is imperative to track housing rentals, purchase transactions, and other expenses which are important for housing affordability estimates. –Gavu (2018) found that electricity and pipe water connections were among the top five determinants of residential rental values in Accra. These variables were considered in previous H+T studies ''– (Isalou et al., 2014; Acolin & Green, 2017; Aljoufie & Tiwari, 2020; Dewita et al., 2020), however, they are difficult to ascertain in household studies in Ghana due to scarce secondary documentation. They are only available to researchers and planners when residents willingly provide them.

Similarly, the multi-modal transport sector mixed with formal and informal transport modes is dominated by private operators. The challenge to transportation planners has always been how to get data from the private sector. Complexities arise when there are different transport modes and inconsistent demand trajectories among commuters. It is easier to track the weekly transportation spending of a household if they travel by the same transport modes than when they change regularly or travel by the available transport modes. Also, it is easier to track transportation spending when mass rapid transit is in high supply because transport fares are stable and subsidized by the state. However, several commuters who are non-vehicle-owners travel by the available mode of transport, hence it is difficult to measure the affordability in light of different transport fares for the multi-modal transport (Alimo et al., 2022). This is even worst in sub-Saharan Africa where informal transport modes such as motorcycle taxis and paratransit are prevalent since their prices are unregulated (Ehebrecht et al., 2018). Research institutions and planners must find ways to document the H+T spending to enhance affordability estimation.

The above discussions focused on data sourcing and documentation but another important factor to consider in the Ghanaian context is the polycentric nature of cities. The polycentric model assumes that commuters do not only travel to the Central Business District (CBD) and all offices are not in the centroid. This deviates from the largely used monocentric model where all workers commute to the CBD and their trip distances and costs may be similar. Considering the large informal sector and street activities in Ghana, the polycentric model needs to be considered along with the monocentric models. That is the topography and zoning plans need to be considered in future H+T studies so that there can be clustered analysis for a better understanding of the H+T burden in Ghana. This means median rental, transport, and income values can be used as applied in Auckland (Mattingly & Morrissey, 2014).

To guide future research, it is worth noting some important variables that case studies in Ghana can consider in light of the limitations of the Ghana housing and transportation market. Given the large informal market where incomes are elastic and usually undocumented, the monthly or annual income can be obtained through surveys. Regarding the housing market, several factors need to be considered. Ghana's housing supply is driven by the private sector rather than real estate developers or the government. This means the chances of cross-subsidy between housing and transport are low amidst difficult rent control. House ownership accounts for 47.2% of the supply market, residential renting forms 31.1%, and rent-free occupants 20.8% (Ehwi et al., 2021). These suggest that a mix of rentals and owners' equivalent rent would be required to predict the housing cost component of the H+T costs. However, these depend on the composition of the households in the city or neighborhood in question. Other variables to be considered are mortgage repayments, electricity, water, sanitation bills, maintenance costs, taxes, residential density, distance from the city center, number of bedrooms, development type, and housing tenure.

Regarding transportation costs, it is preferable to separate private-vehicle owners from non-vehicle-owners. For private vehicle owners, the transportation variables may include the average number of vehicles per household, number of trips generated per day, trip distances, costs of fuel, parking, maintenance costs, and location of the workplace. The transportation costs of non-vehicle-owners may comprise the price and preferred or available transport modes over the same trip distance for all sampled households, trip distance, the number of trips per day, the purpose of trips, and the level of congestion in the city (an ordinal scale). It may also be prudent to consider the weather conditions in the city. For instance, on rainy days, taxi fares are abnormally higher than normal days, especially when commuters have to do roadside ride-hailing otherwise known as “dropping”. Perhaps, one approach to ensure fair representation of these different types of commuters is to focus on one type for each study. However, in segregating, their housing variables or characteristics need to be similar. For instance, the model would be wrong if the sample for the transportation coefficients is different from that of housing.

6.0. Conclusion

This paper reviewed 9 peer-reviewed papers covering the application of the H+T affordability index. It also discussed how the lessons learned can be applied to create a modified H+T affordability index in Ghana, and enhance housing policy and planning. As a novel topic in the Ghanaian context, the variables used in past studies, their strengths and weaknesses as well as the relevant systems required to make their application plausible have been discussed.

The review showed that to adapt a modified H+T Affordability index in Ghana, it is important to build open-source H+T datasets and draft policies that will help planners to track and document transactions in the current private-sector-dominated H+T market. Additionally, the topography and zoning plans should be considered in future H+T studies due to the polycentric developments in some Ghanaian cities. It is evident in all studies reviewed, that the addition of the transportation burden to housing affordability estimates gives a different perspective on the household burden and dipper understanding to guide policymaking. The authors are hopeful that this study can lead to more empirical investigations of H+T affordability in Ghanaian and African cities at large and be incorporated into housing and transportation policies.

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CREATING AN INCLUSIVE BUILT ENVIRONMENT: ACHIEVING GENDER EQUALITY IN THE REAL ESTATE INDUSTRY

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Abstract

There is evidence of gender imbalance in the real estate industry from available academic and industry studies. However, existing studies for this research were mainly conducted on justifying gender inequality in the built environment/real estate industry. Therefore, the research aims to investigate the factors that can lead to a more inclusive built environment, especially in the real estate industry.

The research study utilized primary and secondary sources of data collection. The data was collected from female practitioners in the built environment through interviews. Analyses of leading real estate organizations' organograms, annual reports, and 'male-to-female' ratio of employees formed the cornerstone of the quantitative aspect of the study to justify and demonstrate gender inequality. This completed the primary research methodology of the study. The secondary research included observing annual reports of the firms being studied.

The actual results and findings determined how to achieve a gender-inclusive built environment. The study showed that there is a lack of diversity and inclusivity in the real estate industry. Females also undertake more non-technical roles such as estate agents, while males prefer more technical positions such as property valuers. The gender composition, especially, favours males the higher one goes up the corporate ladder. In conclusion, the study recommended achieving a gender-inclusive built environment based on the results gathered from the data collected. In addition, the theoretical applications concluded from the research findings allow for future research on the 'the cause and effect' of an exclusive real estate sector and how it can be rectified.

Keywords: diversity, equality, gender, inclusion, real estate

1.0. Introduction

With pressure from global organizations such as the United Nations, to achieve Sustainable Development Goals (SDG) by 2030 (Pedersen, 2015); studies aligned to achieving the SDGs have increasingly gained traction over the years. As a result, organizations have begun incorporating gender-related policies within their workplaces. Some of these actions are a result of international and government policies set to address less diverse and inclusive workplaces (UN Women, 2020). For instance, the Norwegian government had set a target of achieving a quota of 40% women on private company boards by 2005; while Spain legislated the same percentage for women in public companies (Warren & Antoniades, 2016). Other nations and companies have taken the initiative without any compulsory government policies or Acts. For example, the Australian government calls for companies, in the form of legislative laws to avert gender discrimination by companies with over 100 workforces, to report the gender structure of their organization (Norberg & Johansson, 2021). It has been proven that workplaces with a more diverse and inclusive environment thrive more than those deficient in implementing gender-related strategies by Norberg and Johansson (2021). This paper specifically focuses on SDG5: gender diversity and inclusion (D&I) in real estate and the desire to reduce gender parity and increase gender equality (Fei, Opoku, Agyekum, Oppon, Ahmed, Chen & Lok, 2021) in the industry.

'Diversity' and 'inclusion' are sometimes used interchangeably; however, they are collaborative terms. Diversity refers to the unique characteristics and ways that differentiate us, while inclusivity harnesses diversity and puts the theories of diversity into constructive action (Moore, Xiong, Bhattacharya, Bustamante & Calvert, 2020). Examples of diversity include the following characteristics: age, gender and/or gender identity, disability, ethnicity, and cultural identity (Patrick and Kumar, 2012). Furthermore, if gender inclusion is included in the working environment, it may be described as an environment that allows individuals to contribute, thrive, and maximize their potential (Deloitte, 2021).

1.2 Background of The Study

Existing studies (Elena et al., 2019; Stewart-Williams & Halsey, 2021) have concluded that STEM (Science, Technology, Engineering, and Mathematics) studies are marketed as gender-specific; therefore, leading to the gender balance skewed in the male's favour and resulting in a lack of gender inclusivity (Achiam & Holmegaard, 2015). Interestingly, the Hypatia Project, that developed the 'Criteria for Gender Inclusion' in Denmark (2015) discovered that young Europeans, both young men, and women especially adolescents, are not well-versed in the

variety of possible careers in STEM and the skills relevant for those career pathways (Achiam & Holmegaard, 2015). The Hypatia Project further confirmed in its report that, in the coming years, with Europe's knowledge economy developing and new technologies on the rise, STEM skills will be needed for a broader range of careers than ever before. These careers include but are not limited to civil engineering, aeronautics, quantity surveying, and information technology.

1.3 The Problem Statement

The study area for this paper is gender equality in the built environment. One of the main concerns of international organizations such as the United Nations (UN) and the World Health Organization (WHO), through the former's Sustainable Development Goal 5 program (SDG5: Achieve gender equality and empower all women and girls) is gender inequality (UN Women, 2020; WHO, 2022). Therefore, the problem statement is the delineated gender inequality status quo facing women in high-level positions. From existing literature, it can be concluded that the higher you go up the hierarchy of an organization, the narrower the hierarchy becomes for the female gender. Therefore, factors that prevent the skewed gender equality, which favours the male gender, from being achieved are the lack of policy formulation and organizational quotas from governments and establishments to encourage and enforce female equality to fulfil the solution to this problem. Moreover, the current absence of a mandatory, enforceable law prevents this problem from being solved. Therefore, developing a more effective theoretical framework on gender inequality in the working environment could assist in implementing mandatory policies to achieve gender parity. This discussion begins with identifying the research objectives and the questions that will be addressed accordingly.

The paper aims to determine the challenges that prevent the creation of an inclusive built environment. Achieving this research aim will allow for preventative measures for gender inequality to be put in place and policies around creating inclusivity in the industry to be formed, and for more discussions centered around gender equality. The objectives that the aim of the research will accomplish are described below.

1.4 Objectives of the Research

The objective of this study is to determine how the residential, commercial, and corporate development environment in the built environment, can achieve gender inclusion and equality, using a case study of the private and publicly listed organizations in Botswana for data collection, and analysis, and benchmarking. Subsequently, this main objective is broken

down into the following sub-objectives. To:

1. Determine the level of the lack of gender diversity in the real estate industry
2. Identify the factors that lead to gender diversity and harnessing inclusivity in the real estate industry

1.5 Research Questions

This main research objective has been broken down, linked to the related research questions, and tabulated in Table 1 below.

OBJECTIVES	RESEARCH QUESTIONS
Objective 1: To determine the level of the lack of gender diversity in the real estate industry.	• **Research question**: How can we determine the level of the status quo of gender diversity in the real estate industry?
Objective 2: To identify the factors that lead to gender diversity and harnessing inclusivity in the real estate industry	• **Research question**: Which factors have led to gender diversity and how can we harness inclusivity in the real estate industry?

Table 1: Objectives and linked research questions (Author's compilation)

Consequently, there is an increase in 'gender & inclusion' literature in the academic sphere due to increased interest in the topic. Therefore, secondary data obtained from conferences, journals, and professional articles and reports will be used to draw extrapolations to support the research study. Interviews will be administered to female built environment practitioners specializing in the real estate sector to complete the data collection.

1.5.1 *The Relationship Between Diversity and Inclusion*

The terms 'diversity' and 'inclusion' are sometimes miscomprehended for the other. However, these terms are not synonymous; rather, they are used collaboratively (Krithi & Pai, 2021). 'Diversity' is described as having a variety of faces in an organization such as different races, gender, ethnicities, ages, and others (Moore, et al., 2020). In the context of this paper, the focus is not on gender diversity which is the unique characteristics of males and females (Satti, Onyebadi & Memani & 2019), but rather on 'inclusion'. Gender inclusion incorporates putting the concept and practice of diversity into practice and developing an environment that harnesses the distinctiveness of a diverse environment where individuals can uncover their separable and unique potential (Jordan, 2011).

1.5.2 *Committing To Gender Equality, 'Diversity & Inclusion (D&I) In The Workplace*

Achieving gender equality has been a trending and prioritized topic of concern for

international organizations such as the United Nations. To put this in perspective, Sustainable Development Goal 5 aims to 'achieve gender equality and empower all women and gender (United Nations, n. d). This commitment has spilled over to include the workplace over and above socioeconomic factors. The Fourth Global Forum on Business for Gender Equality held on the 28th of February 2018 (SDG Knowledge Hub, 2018), aims to eliminate existing gaps in the workplace under the focus of 'The Future of Work and the 2030 Agenda'. This was specifically for the country of Chile.

The Forum noted the link between SDG 5 and SDG 8, the latter of which aims to provide decent work and economic growth by 2030. The efforts of the United Nations are supported by academic research as well. One study's results noted that adapting inclusive leadership positively correlates to negative ethnic-cultural diversities and inclusivity (Tanachia, Sandra & Ben, 2020). Results of another study conducted in India acknowledged that diversity and inclusion have been fairly under-researched areas (Klarsfeld, A., Ng, E. S., Booysen, L. A., Christianson, L., & Kuvaas, B., 2016). There have also been special calls for more diversity and inclusion-related academic research, especially in developing and under-developed economies (Emerald Publishing, 2020). However, the Indian study acknowledges that lack of diversity and inclusion may influence how employees behave, resulting in low work self-drive, high absenteeism, and job dissatisfaction, resulting in employees resigning from their job (Urmila & Bagali, 2018). Given these existing research results, the next section addresses the importance of a gender-inclusive built environment and why it's imperative to commit to gender equality and diversity and inclusion in the workplace.

1.5.3 *The Importance Of Gender Inclusivity In The Built Environment*

Gender inclusivity has been an ongoing topic of discussion across various industries. The built environment is no different. The built environment has frequently been referred to as a 'male-dominated' industry that lacks diversity and inclusion (Soo-Cheen, Sanmargaraja. & Soon-Ham, 2020). Prioritizing gender inclusivity in the built environment (BE), from a female perspective, not only diversifies the industry but also gives females the opportunity to apply their creativity, innovations, and a different outlook to problem-solving and strategic thinking that compliments those of their male counterparts. Therefore, we need to unpack the existing barriers to gender inclusivity and how to break down these barriers.

The UNDP noted that equality of women in the workforce could contribute US$28 trillion to the worldwide economy within four (4) years (by 2025) (Ashikali, et al., 2020). In addition, a study in India has found that diversity in industries adds tangible and intangible values to the culture of the company (Vijayalakshmi & Neharika, 2015).

According to Deloitte's Global Human Capital Survey, D&I is vastly important in increasing business performance. This is because D&I matters investigate and critically analyse the performance of an organization and how innovation and creativity within teams can be optimized. Statistically, organizations are six (6) times more likely to achieve innovation, can increase their performance by three (3) folds, and are eight (8) times more likely to increase their performance as a business (Deloitte, 2021).

D&I can bring organizational benefits that are directly linked to company performance. For illustration, organizations with inclusive cultures are twice as likely to meet or exceed financial targets and are three times as likely to be high performing. Additionally, companies are six times more likely to be innovative and agile and eight times more likely to achieve better business outcomes, as Deloitte partner Juliet Bourke found in her research. The below chart illustrates and summarizes the organizational benefits linked to a company's organization if it employs gender diversity and inclusion within its internal business operations and policies.

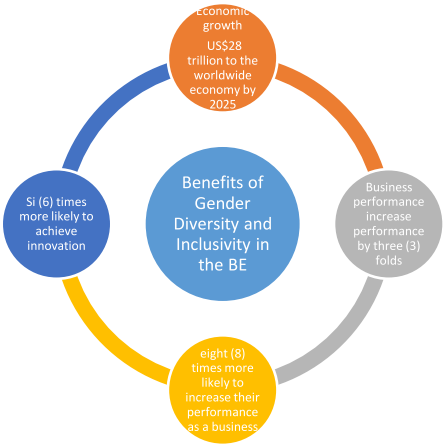

Figure 13: Benefits of Diversity and Inclusion in the Built Environment (Author's compilation)

Some notable advantages of gender inclusivity include an increase in innovation (Ritter-Hayashi & Vermeulen, 2019), a reduction in interpersonal bias (Nishii, 2012) as well as the creation of sustainable societies (Ceylan, 2020).

1.5.4 *Barriers To Gender Inclusivity In The Real Estate Industry*

The domination of males in real estate can be traced back to the 1700s in the United States (The CE Shop Team, 2021); however, the importance of D&I was only brought to light in the 1960s (Rohini & Winters, 2008). Thus, one of the main causes of the existence of barriers to gender inclusivity is obliviousness. Upon acknowledging the problem, the means to solve it

can then be developed and applied to resolve the difficulties.

This last statement is supported by Deloitte's 'Article 6 Diversity & Inclusion in the Real Estate Industry' industry report (Deloitte, 2021); the real estate sector's primary stakeholders need to 'identify and acknowledge' that gender imbalance/parity exists within the industry. However, the lack of acknowledgment means that the lack of D&I goes unnoticed. Therefore, it is challenging to develop an applicable structure to address the problem if a framework has not been defined.

Despite initiatives to recruit women, the industry remains one of the most gender-segregated industries in the world. Increased knowledge about gender has been identified as needed to change the status quo (Norberg, 2021). Figure 2 below summarizes the 'identified barriers to gender diversity and inclusivity in the built environment'.

Figure 14: Barriers to Gender Inclusivity in the Built Environment (Author's compilation)

1.5.5 *Proof of The Existence of Gender Imbalance in The Real Estate Industry*

The equality and diversity and inclusion of women in the built environment may encourage more females to enter the industry. However, it is being reported that the dominance of men in the industry puts off potential work candidates in the industry because of a lack of females to look up to and also to mentor them during their careers (Noe, 1988; Caprice et al., 2018). Also, the underrepresentation of women is attributed to cultural and structural problems as well as the pre-conceived nature that females are predisposed to work (Soo-Cheen, et al., 2020).

1.5.6 *The Lack of Gender D&I In The Built Environment*

In 2016, a study conducted in Australia encompassing eighteen (18) real estate companies

with a total of 3800 employees found that the ratio of male senior employees outnumber those of females by a ratio of three to one (3:1) (PricewaterhouseCoopers, 2016); while females make up a higher percentage of the workforce in non-leadership positions in the real estate industry.

The following data was collected from a study conducted by the Commercial Real Estate Women (CREW) Network Benchmark on diversity, equity and inclusion in 2020 (LeFurgy, 2020). The composition of males to females in commercial real estate is 37% to 63%, respectively. The disparities between gender remunerations favoured males who accounted for 83% of the more favourable remunerations compared to their female counterparts who accounted for 17%.

Although there are few journal articles (Tsai, 2018) and books (Clack & Gabler, 2019) about gender D&I focusing solely on the built environment or real estate, and studies put together by real estate research companies; there are statistics that confirm the lack of gender parities, D&I, as per the illustration of the figures 1 and 2.

Although the current studies and professional reports may be negatively skewed, the CREW Network has noted some positive progress for women in real estate in the United Kingdom, Canada, and the United States as per Table 2 below:

INCREASES/DECREASES IN OVERALL STATISTICS OF EMERGING FEMALE PROFESSIONALS IN THE INDUSTRY	INCREASES/DECREASES IN FEMALES IN AGENCY SERVICES	FEMALES ASPIRING TO ADVANCE THEIR CAREERS TO THE C-SUITE
5.4%↑ (from respondents from 39-year-old women and below.	29%↑ (6% increment from 2015 to 2020).	4%↑ (32% increment from 2015-2020) Commercial Real Estate Female Professionals only occupy 9% of the C-Suite position out of 36.7% of the total commercial real estate sector.

Table 2: Increases and decreases of emerging females in the industry (Author's compilation)

1.2 Tokenism Theory

The theory of tokenism by Kanter is the underlying theory that applies to this research. 'Tokens' are individuals that are expected to experience challenges and hardships such as limited career opportunities (Stroshine & Brandl, 2011). Tokens are noted to comprise 15% of the total workforce; a theory that we will test in this study. Tokenism is noticeable in career paths that are dominated by one gender over the other. The opposite gender is usually selected and appointed to even out the lack of gender diversity and on the mere merit that they are of a different gender (Zimmer, 1988).

This research relied on the grounded theory from a personalist vantage point, which forms the paper's theoretical framework. The employment of the personalist theory describes and construes the experience of women in gender relations from their point of view (Y. flores, 2018). Consequently, the research conducted adapted primary data collection from women in the real estate industry, which consists of their shared experiences working alongside their male counterparts. The research methodology is elaborated in the next section of this paper.

2.0. Gender-related Literature In The Real Estate Industry

The real estate industry is largely considered to be male-dominated (Wylie, 2016). This is especially true as females move up the corporate ladder; their numbers decrease as they approach C-Suite or Board Level positions, while males are not affected the same way, as more men are in top-level positions.

The main driver of gender pay gaps within the United Kingdom's real estate sector is the high disparities between the proportion of higher-paid women and the rest of the workforce (PWC, 2019). While in the United States of America, subjective claims of no enhancement in diversifying the industry, gender-wise, were noted between 2007 and 2015, as reported by the United States Equal Employment Opportunity Commission(Brenzel, 2018).

2.1 Gender Distributions in Technical Versus Non-Technical Roles

The Royal Institute of Chartered Surveyors (RICS) has released statistics, shown in Figure 2.2, which see only 11% of the sector comprises females, with only 1.2% working in manual labour trades (RICS,2016).

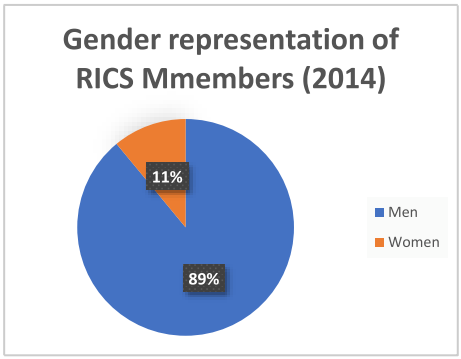

Figure 2.2 Statistical comparison between women and men accredited by Royal Institute of Chartered Surveyors (RICS, n.d)

Furthermore, according to data from the Office for National Statistics and industry surveys in the United Kingdom, the statistics have not improved as of 2017, with only a 2 percent (2%) increase for each gender in the United Kingdom (Anon., 2014). In 2015, the RICS recorded a slight increase of 1% from the previous year in the number of women entering the UK's surveying industry. These statistics continue to reinforce the theory of a male-dominated industry that is not inclusive.

Moreover, there are more female CEOs in the industry's housing sector than in the commercial real estate sector (Pauli, 2011). In addition, females dominate administrative and secretarial roles in Australia, while males have higher technical and professional posts (Poon, J, 2016). This study's findings can be utilized in conjunction with the results of Dimoviski's study (2016), which showed that firms that focus on management and development in Australia have the lowest proportion of female directors on their boards. These findings show that there is a lack of inclusivity of women for technical real estate roles.

1.2.1 *Female Representation at Senior Management and Board Level*

A study demonstrating gender diversity and inclusivity at two leading organizations in Australia (Ernst & Young, 2014) indicates that even though many women hold senior positions and serve on Boards in the industry, representation in the industry is still male-dominated. Similarly, women on Boards and Chairs in Real Estate Investment Trusts (REITs), property development companies, construction/engineering, and agency companies are deficient, making up less than twenty (20) percent of each organization's employees. This supports the tokenism theory stated in the introduction of this paper. Contrarily, the same study shows a more significant percentage of women in managerial and below managerial levels than at CEO and senior management levels. These results further support the assumption that women do not occupy higher-level positions but rather majorly fill out the middle-level positions.

A compelling study demonstrating gender diversity at two leading organizations in Australia has shown thought-provoking results (Ernst & Young, 2014). It was found that even though there are several women in senior professional positions and serving on Boards in the property industry, representation in the industry is still male-dominated and not inclusive. This parity is illustrated in Figure 2.3. Similarly, the illustration of women on Boards and Chairs in the REITs, Property development companies, construction/engineering, and agency companies is very low, making up less than twenty (20) percent of each organization's employees shown in Figure 2.4.

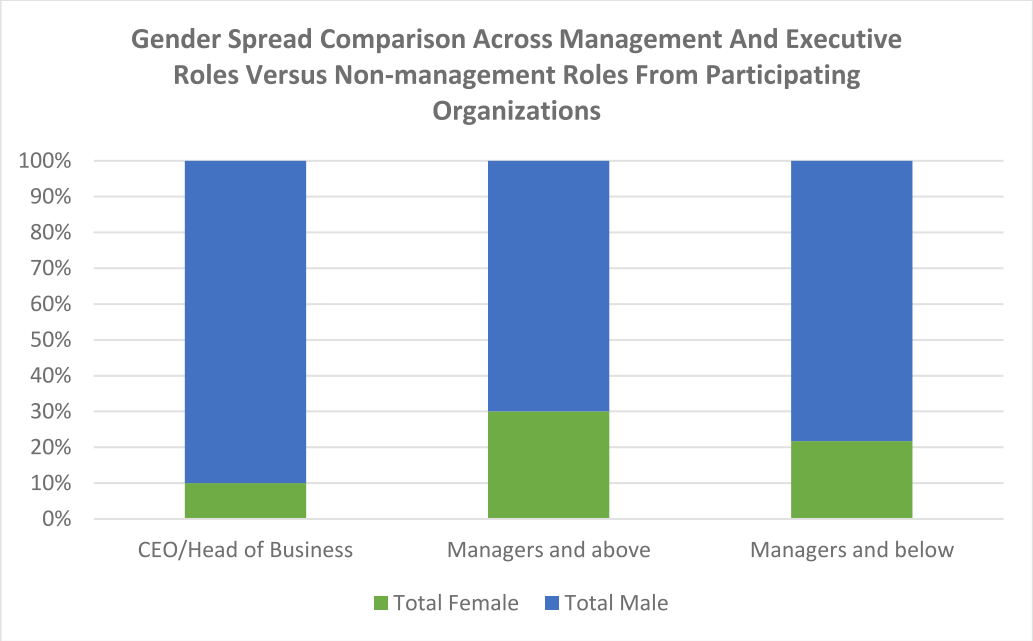

Figure 2.3 Male To Female Ratio Of Board Representation. (SOURCE: Ernst & Young, 2014)

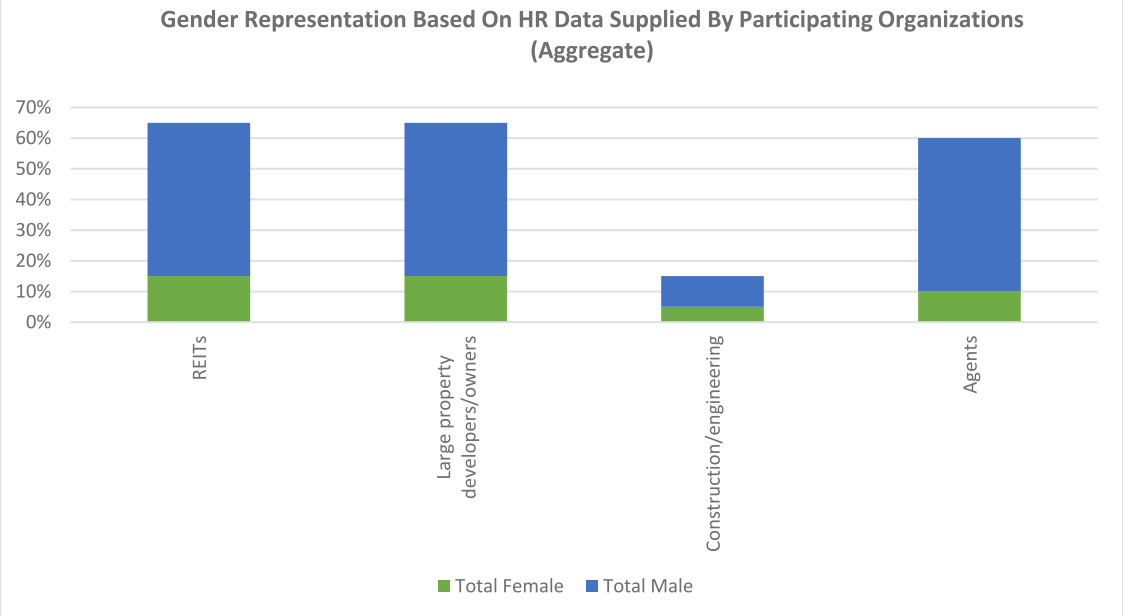

Figure 2.4 Board And Chair Gender Representation In Australia. (SOURCE: Ernst & Young, 2014)

The Dimoviski (2016) study shows a more considerable percentage of women in managerial and below managerial levels than CEO and senior management levels, as shown in Figure 2.4 above.

The Australian Real Estate Financial Sub Industry groups have the lowest number of female directors serving on their boards; eight (8) women were on the thirty-five (35) company boards studied compared to 159 men on the said number of boards in 2011. (Dimovski et al., 2016).

The literature review covered above supports how real estate is not only an industry that could be more diverse but also more inclusive. Research has shown that females mainly dominate administration and non-technical roles, while males dominate technical and senior-level roles. The remuneration of employees in the industry also significantly favored males over women.

The next section discusses and analyses the data collected from this particular research study.

3.0. Research Methodology

The research methodology composition used to achieve the aim of the study, which is to find out how the built environment, with a specific focus on real estate can achieve gender inclusion and equality, required the researcher to confirm if indeed there is no gender D&I in the real estate sector.

The aim of the data collection was to collaborate on the gender perception of the industry as male-dominated and to what extent they feel its effects if they do agree with the stance. Therefore, to achieve this, a total of ten (10) companies, five (5) listed on the Botswana Stock Exchange, and another five (5), which are private entities, were identified and purposively selected for data collection and analysis. These companies selected all have 'operational board members in common, either in the public or private sector. The data was collected by sending structured interview questions to the participants electronically and responding to the questions. Upon completion, they returned the answered interview questions.

In addition, an analysis of the publicly listed management board's gender ratio of the non-listed companies on their websites completed data collection for this study.

3.1 An Analysis Of Board Members Of Real Estate/Construction Companies Listed In The Botswana Stock Exchange

Although board members are not employees of a company, their appointment is based on their career progression and experience, which is relevant to the study as the board composition of real estate companies highlights the gender structure and inequality. The study does not only seek to create an inclusive built environment for employees, but for stakeholders across the board. Therefore, secondary research was undertaken on the Board Members of Real Estate/Construction Companies listed on the Botswana Stock Exchange (BSE). Currently, out of the thirty-one (31) companies listed on the BSE, only five (5) are real estate companies. These entities are:

- Letlole la Rona
- RDC Properties
- Far Properties
- New African Properties
- PrimeTime Properties

These entities specialize in the development, ownership, and operations of real estate throughout Botswana. They cover a wide range of property portfolios, including residential, commercial, industrial, and hospitality. The gender distribution of these entities is shown in Table 3.

NAME OF COMPANY	TOTAL NO. OF BOARD MEMBERS	NO. OF MALE BOARD MEMBERS	NO. OF FEMALE BOARD MEMBERS	PERCENTAGE OF FEMALES OVER MALES ON THE BOARDS (rounded off to the nearest percentage)
Letlole la Rona	6	5	1	17%
RDC Properties	7	5	2	29%
Far Properties	6	5	1	17%
New African Properties	6	5	1	17%
PrimeTime Properties	5	3	2	40%
TOTAL	**30**	**23**	**7**	**23%**

Table 3: Gender Distribution Between Males And Females Serving In BSE-Listed Real Estate Entities (Author's Compilation)

Solely, analysing the gender disparities in the table above, there is evidence of a lack of gender diversity in BSE-listed entities from a secondary research point of view. In addition, the below-mentioned private real estate companies also confirmed the lack of diversity in top management/C-Suite; an additional five (5) private companies were investigated. These companies are:

1. Khumo Properties
2. Seeff Properties
3. Apex Properties
4. E-Man Group

NAME OF COMPANY	TOTAL NUMBER OF BOARD MEMBERS	NUMBER OF MALE BOARD MEMBERS	NUMBER OF FEMALE BOARD MEMBERS	PERCENTAGE OF FEMALES OVER MALES ON THE BOARDS (rounded off to the nearest percentage)
Khumo Properties	10	5	5	50%
Seeff Properties	3	2	1	33%
Apex Properties	7	7	0	0%
E-Man Group	4	4	0	0%
Exponential Investments	5	5	0	0%
TOTAL	**29**	**23**	**6**	**21%**

Table 4: Gender Distribution Between Males and Females on The Boards of Private Companies (Author's Compilation)

5. Exponential Investments

The investigated companies specialize in property development, ownership and operations, valuation, real estate agency, and property management. This information was collected by visiting the official company websites to derive their Board's composition. The distribution is shown in Table 4.

3.2 Primary Data Collection: Interview Responses

As previously stated, the data collection approach that will also be employed will be interviewing women in real estate companies serving in top management, boards, or the C-Suite. A total of 5 females from real estate companies were invited but only three agreed to participate in the survey. The research participants ranged from different pathways in real estate such as estate agency, property valuation, and management.

The data collected was analysed using expressions of the contents by each participant. Furthermore, a comparison of the data gathered from all the participants was drawn. Finally, to support or debunk existing literature results, gender-based concepts related to the respondent's answers will be linked. In addition, the respondent's answers were transcribed verbatim as per their responses to the interview.

3.3 Discussion

To answer the two research questions of how can we determine the level of the status quo of gender diversity and the factors that have led to gender diversity and how can we harness inclusivity in the real estate industry observing, a methodology of transparency and reproducibility has been developed, to minimize bias. This methodology includes data collection from females on all employment levels, from lower to senior level professionals. Additionally, males are also included in the study. The criteria for the methodology are both qualitative and quantitative research. These data collection methods, both primary and secondary, can be duplicated in different countries. Studies that meet this criterion include Pauli's (2017) gender structures research, which shows that men are often in higher and technical posts while women are usually in lower and non-technical posts, and Fenn-Smith's (2019) report, which concludes that achieving a gender balance in the industry requires effort, especially at senior and management level. As the sample size is already limited, the exclusion criteria are companies whose information was not easily accessible, either through research collected from their websites and/or primary knowledge of the companies' board and employee composition. These were excluded due to the time constraints faced while conducting the research.

3.4 Qualitative Research Analysis: Analysing The Research Participant's Responses

To capture the participants' responses accurately, some of the important responses have

THEME	RESULTS FROM AVAILABLE LITERATURE	QUOTES FROM RESEARCH PARTICIPANTS
Gender domination	The real estate industry is viewed as predominantly male-dominated, especially from research results from Western Countries.	1. "Yes, I do." 2. "I do not believe my industry is predominantly male, quite the contrary, however, I do believe the males in our industry succeed better than the females because they work together as one force 'the Gentlemen's club' which is where women here and the world across are still failing to do. My experience in working with the opposite gender is if they value you, they tend to either try to use your experience and connection or know how to elevate themselves; I doubt that they will even work with you if you aren't considered valuable." 3. "No."
Factors influencing venturing into the real estate industry	• Socioeconomic factors • Cultural influences • Personal influences, role models, or, mentors	1. "My elder brother is a quantity surveyor, and he motivated me to venture into the industry. My love for buildings as well influenced me" 2. "Being an Estate Agent has flexible hours and it suited my lifestyle with three small children at the time. I was my own boss. Culturally there is an expectation that women deal with Residential letting and sales but I deal with commercial, industrial, tourism, and, agricultural properties as I come from a trading background and have a wide knowledge of development in a variety of areas in Botswana. I find that commercial is less emotionally driven than residential". 3. "I grew up in a real estate family with my father in the industry as a civil engineer. He's never taught me that this is for men and not women."

Non-technical versus technical roles	• The capability of women in technical roles	1. "I stay in my world not observing what anyone else really thinks, whether I wear stilettos on a Monday and end the week in overalls does nothing for my gender, I will still have my make-up or nails done or undone depending on my needs as opposed to what the industry dictates." 2. "Yes, I have. Even for an estate agency. Males dominated the commercial side; female gender dominated the residential side." 3. "Women are far more thorough with the technical aspects. I deal with female valuers, surveyors, architects, and engineers, and all are capable."
Diversity and Inclusion (D&I)	• Gender diversity • Breaking the glass ceiling • Importance of D&I • Roles organizations can play for D&I • Roles governments can play	1. 'There are few women as you go up the corporate ladder." 2. No lack of gender diversity at all 3. "There is a need for diversity and inclusion as there is still a gap in most governments though male and female have same qualifications." "It is important for us to know to value passion over social norms. A valuer or bricklayer or facilities manager is never defined by sex" 4. "Organizations in the real estate have to make a deliberate policy decision for diversity and inclusiveness. " 5. "Governments should have policies and quotas reserved for females to promote D&I." "Nothing but awareness, Government interference is at times nonsensical, for this issue you would rather have a mutually beneficial environment that isn't forced upon any players in the market so that growth is harnessed and enjoyed by both the willing employer and employee."

Table 5: Comparative Summaries Between Available Literature (Secondary) And Answers By This Study's Participants (Primary Research) (Author's Compilation)

been quoted verbatim. In addition, there were three female respondents out of the initial five that were reached out to. Table 5 compares the results of the available literature, which were reviewed in this study, with the responses from the research participants.

4.0. Limitations Of The Study

The research conducted could have benefited from a wider research pool. The sample size of only three interviewees is very low, and having more participants would have possibly had an impact on the results of the study.

Finally, the conclusion of the discussion and analysis section only includes senior and managerial-level individuals, which is only the horizontal parameter. No discussion of individuals on the vertical parameter in the companies, e.g. mid-level and lower-level individuals are considered.

5.0. Results

The objectives of the study have been achieved. For objective one, the interview results confirmed that there is no lack of gender diversity in the real estate industry. However, the research analysing the gender composition in the real estate industry at a higher level (senior management and the Board level) confirms a lack of gender diversity the higher you go up the corporate ladder. Additionally, males in the industry are given more challenging tasks

OBJECTIVES	RESULTS OF THE STUDY
· **Objective 1** : To determine the level of the lack of gender diversity in the real estate industry.	· The secondary research analysing the gender composition in the real estate industry at a higher level (senior management and the Board level) confirms a lack of gender diversity the higher you go up the corporate ladder in the industry.
· **Objective 2**: To identify the factors that lead to gender diversity and harness inclusivity in the real estate industry.	· Socioeconomic factors lead to gender discrimination and lack of inclusivity. However, on the same accord, females typically assume technical roles while males assume non-technical roles, mainly because females are more emotionally driven and considered 'homemakers'.

Table 6: Objectives and Results of the Study (Author's compilation)

compared to females. Also, it is noticeable that females dominate the residential sector while males dominate corporate and commercial real estate. Table 6 links the objectives of the study to the results found.

For objective 1, we confidently confirm that the gender compositions in higher level positions (Senior management and at Board level) favor males. Therefore, there are fewer females than males in top positions. For objective 2, it can be agreed that socioeconomic factors lead to gender discrimination and lack of inclusivity. However, on the same accord, women in real estate do not face gender discrimination as much as assumed but feel included and embraced by their male counterparts in most instances. This confirms that females typically assume non-technical roles while males assume technical roles, mainly because females are more emotionally driven and considered 'homemakers'.

6.0. Conclusion

The results of this study show that there is a lack of diversity and inclusivity in the real estate industry. Females also undertake more non-technical roles such as estate agents, while males prefer more technical positions such as property valuers. The gender composition, especially, favours males the higher one goes up the corporate ladder. This paper has the potential to open up more discussion on diversity & inclusion in real estate. A larger research population and sample size would be ideal as there were only three (3) participants out of the five (5) that were invited to participate in the study.

This will ensure that there are more diverse responses and engagement. Finally, including males as participants would provide an alternative point of view to take into consideration. Having both males and females participate in the study would also give fair assessments. Finally, follow-up papers based on this one can include how organizations and the government can create policies that compulsorily mandate D&I and its implementation in the private sector and the government ministries mandated to oversee the built environment.

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ISOMORPHISM OF CLIENT SATISFACTION AND CLIENT SOPHISTICATION IN CLIENT INFLUENCE ON VALUATIONS: A SYSTEMATIC CONTENT ANALYSIS

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Abstract

While some pioneering works have reported the significant influence that clients have to sway the behavioural perspectives and value opinions of property valuers, others have examined the increasing trends of client sophistication in their demands on valuers and advised valuers to work towards client satisfaction. Several studies have also examined issues of client influence, client sophistication and client satisfaction in valuations but none of the available studies have endeavoured to establish the nexus between the concepts so as to report the very significant implications. Hence, this study determines the nexus between client satisfaction and client sophistication and how the two concepts amount to client influence in valuations.

As a hybrid of systematic literature review and content analysis, this study undertook a critical exploration and a systematic appraisal of literature to fulfil the aim of the study. A database search for 20-year (2001-2021) extant studies was conducted using Google Scholar, Science Direct and Primo. The framework of Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) was adopted in the study and a mapping process based on content analysis was undertaken to establish the links among the concepts of study.

Clients' demand for improved accuracy and consistency in valuations; clients' demand for transparency, rationality, and reliability in valuations; and the paucity of relevant market data as well as other market imperfections (among others) constitute issues of client satisfaction to valuers. However, the increasing emergence of more sophisticated, growth-explicit, and

cross-disciplinary investment valuation (and statistical) models; the valuers' incapacity to adapt and adopt “difficult” computational models; as well as clients' subject expertise, experience, and information power (among others) reflect the level of client sophistication. Resulting from the above, valuers are surreptitiously subjected to client influence and compromise through client sophistication in their quest to obtain client satisfaction while undertaking valuations.

Keywords: client influence, client satisfaction, client sophistication, influence, valuation

1.0. Introduction

Valuation is a wide-ranging field. Valuations are used, amongst others, for mortgage, privatisation, taxation, sale, visa processing, acquisition, bestowal, insurance, and asset declaration. In undertaking various valuation assignments, it is a common knowledge that valuers get to meet clients of multivariate backgrounds. These clients may have different technical exposure, socio-political power, educational status, market knowledge and experience with attendant influential power. Authors have observed that clients (or consumers) may sometimes display evidence of awesome capability in making sound, informed and competent decisions (Garry and Harwood, 2009; Liu, 2010; Titus and Bradford, 1996).

Besides, authors have noted that the present-day parlance of professional service delivery is subject to a dynamic and sophisticated clientele (Dawson, 2005, p. xvii, 2005b, p. 1; Ogunbiyi and Oladokun, 2022). The result is that, among other factors, demand for innovative business practices and advancements in business processes, globalisation and the increase of available knowledge (especially made possible by the advent of the ICT), are subjecting real estate practice to continuous calls from clients for improvements and developments in practices and standards (Ogunbiyi and Oladokun, 2022; Oladokun and Ogunbiyi, 2018). Similarly, many a time, registered real estate professionals may fall below client requirements. This is owing to discrepancy between the “perceptions and expectations” of parties to transactions and the actual “performance” of some slipshod professionals (Araloyin and Ojo, 2011). This situation can be tied to the profiles, processes and characteristics of the valuation firms and the clients involved.

Occasioned by the increasing capability and sophisticated knowledge of current-day clients, client influence in valuations is plethoric. While prior studies by Levy and Schuck (1999; 2005) reported the significant influence that clients have to sway the behavioural perspectives and

value opinions of property valuers; Ogunba and Ajayi (2007) reported the increasing trends of client sophistication in their demands on valuers and advised valuers to work towards client satisfaction.

Client satisfaction may be described as the sensation that occurs when clients render a good assessment or are pleased with their purchase or procurement choices (Hoyer and MacInnis, 2010, p. 279). According to Isac and Badshah (2018), client (or customer) satisfaction is a marketing concept that evaluates how well a company's deliverables meet or surpass customers' requirements. On the other hand, client sophistication may be defined as a state of having relatable knowledge of technical subject as well as being intellectually and/or practically experienced by one who pays for a service. In other words, it is a situation resulting from clients' technical knowledge, experience, and exposure, as revealed in their requirements and expectations of valuation service providers. Ogunba and Ajayi (2007) opined that clients' increasing demands for advanced valuation techniques portray their sophistication. Meanwhile, client influence refers to the client's interference in valuation in order to sway the valuer's disposition and to bias valuations. Crosby et al. (2010) regarded it as client's distortion of the valuation process with the goal of methodically prejudicing valuation results. Although valuers have some degree of independence in exercising their valuation judgments, the intricacies of market environment sometimes make such judgments susceptible to bias (Klamer et al., 2017). Similarly, valuers' motivations for succumbing to client influence may include corruption, misconduct, and concerns about loss of clients (Nwuba et al., 2015). Biased valuations are also motivated by valuer ineptitude and willingness to position financial gains above professional ethical codes (Smolen and Hambleton, 1997).

Again, while Levy and Schuck (2005) opined that, not all client influence in valuation deviates from market value; Ogunba and Ajayi (2007) submitted that valuers' constructive response to client sophistication may lead to improved client satisfaction in investment valuations. Several studies have examined issues bordering on client influence, client sophistication and client satisfaction individually, but none of the available studies have endeavoured to constructively detail the nexus between the concepts so as to report the very significant implications to professional valuation service. Yet, the seemingly current high sophistication of clients, driven by the need for transparency and accountability in the process of valuation service delivery, often exerts pressures on the integrity of professional valuers and questions their professional capabilities especially when measured in line with global standards. There is also the challenge of Nigerian valuers being considered professionally qualified by the

foreign investors and multi-national organisations, many of whom are being wooed into the Nigerian market. If Nigerian valuers would demonstrate their capabilities to be professionally competent like their foreign counterparts, there is the need to understand the nexus between client satisfaction and client sophistication and understand how the two concepts may amount to client influence in valuations. This study therefore examines, through literature review, past efforts and studies on client satisfaction and client sophistication. It thereafter correlates the results with past findings on client influence for an in-depth understanding of the nexus among them.

1.1 Research Questions

The aim of this study is to provide an in-depth review of literature to investigate the nexus between the concepts of client satisfaction and client sophistication; determine whether they amount to client influence in valuations, and provide a reliable trajectory for the empirical study of the subject. To this end the following research questions are proffered:

1. What issues surround the application of the concepts of client satisfaction, client sophistication and client influence in the literature?

2. Are there correlations among the literature-established issues in the application of the concepts?

2.0. Methods

A database search for 20-year (from 2001 to 2021) relevant extant studies was conducted using Google Scholar, Science Direct and Primo. 20-year-period search was determined for this study because the two earlier studies that engendered interest on the subject of study were written in the 2000s (see Levy and Schuck, 2005; Ogunba and Ajayi, 2007). Besides, it is the informed opinion of the authors of this study that, research on client sophistication requires recency (occasioned by ICT disruptions of nearly all old ways). Then again, time and resource constraints could only allow this time period for the research. Although systematic reviews can be time-consuming and resource-intensive (Khirfan et al., 2020), this method will reveal the extent and depth of works carried about in the last 20 years and will give the proper understanding of successive findings which are required as bases for this study.

Apart from being renowned among scholars as having copious repository of articles, Google Scholar, Science Direct and Primo were specifically chosen because the platforms readily have delimiters, which help in the elimination and selection process on extant articles. Such

delimiters include selection by peer reviewed or otherwise; subject area; range of years (2001-2021), and being responsive to Boolean operators.This becomes necessary as a form of validity check for the current study - as it allows for replicatory confirmations. The three platforms used for database search in this study were sufficiently used in Khirfan et al. (2020). Database-searches were focused on the key terms and concepts underlying this study; thereafter, the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) and content analysis were adopted for further evaluation of culled data.

2.1 Combined PRISMA and Content Analysis – Systematic Content Analysis

Reviews of the literature are essentially qualitative assessments that offer important means for comprehending a topic's viewpoint, particularly in the context of an increase in research findings that is frequently divergent and conflicting (Khirfan et al., 2020; Seuring and Gold, 2012). Literature reviews are regarded as significant improvements to scholarly work since they serve as a platform for theory conception and serve to map, integrate, and reconcile disparate understanding on a subject (Khirfan et al., 2020). The absence of rigorous methodology and the dependence on academics' subjective assessments are the main criticisms of literature reviews (in comparison to more thorough empirical studies) (Seuring and Gold, 2012). As a result, systematic and coherent procedures for examining the literature arose, ensuring that the analysis is free from the bias of the researchers and that analytical approaches for systematic classification are rigorous, methodical, and reproducible (Haggarty, 1996; Khirfan et al., 2020; Seuring and Gold, 2012).

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) framework, comprising a step-wise process of “Identification, Screening, Eligibility, and Inclusion” (Moher *et al.*, 2009) is increasingly being accepted as a very logical, reliable and replicative model in the selection of studies for systematic reviews (see Nurick and Thatcher, 2021; Peters et al., 2015; Ullah et al., 2018; Vivolo-Kantor, 2014). With PRISMA, the systematic review provides a more thorough procedure for selecting and evaluating available literature. The screening procedure aids to exclude information that is not pertinent to the study's objectives and in maintaining a specific scope; whilst the meta-analysis offers some form of statistical analysis that is included in the systematic review (Nurick and Thatcher, 2021; Ullah et al., 2018). The use of the PRISMA framework enables a perspicuous and coherent method that demonstrates how publications are designated as included for subsequent detailed reviews and analysis (Nurick and Thatcher, 2021). Researchers are urged by Seuring and Gold (2012) to undertake more thorough literature reviews when establishing useful guidelines and sharing findings using content analysis.

Qualitative data, like those gathered through unstructured or semi-structured surveys or web-based documentations can be analyzed using Content Analysis. Content Analysis stands as a useful tool for conducting a systematic and guided analysis of a collection of research materials (Seuring and Gold, 2012). Guided by pre-determined objectives, content analysis is utilized to draw replicable and reliable conclusions by analyzing (coding) the properties of written, verbal or visual documents (Elo and Kyngäs, 2008; Forman and Damschroder, 2007). The systematic robustness of literature reviews is increased by turning qualitative data into quantitative assessment through methodical examination (Forman and Damschroder, 2007). This open framework is used to describe or assess a topic in order to offer fresh perceptions, interpretations, and, ultimately, recommendations for action (Elo and Kyngäs, 2008; Khirfan et al., 2020; Krippendorff, 2004).

Furthermore, content analysis allows for the evaluation of qualitative data through a rigorous examination of manifest information as well as latent details. Particularly, one can differentiate between looking for manifest or latent content while analyzing texts. While software tools can help with the former, the latter is far more difficult because it depends on the researchers' inferences (Seuring and Gold, 2012). Kolbe and Burnett (1991) emphasize the exceptional significance of transparency, which must be achieved by thorough communication of the method used in the whole process of the research. This is because methodology disclosure is essential for assessing the quality as well as efficacy of content analysis as used in a study and for enabling replication (Kolbe and Burnett, 1991; Khirfan et al., 2020; Seuring and Gold, 2012). Thus, attempts are made in the current study to clearly detail every step adopted in achieving the aim of the study using the framework of systematic content analysis.

Moreover, the procedure for (qualitative) content analysis consists of four key steps, which are as follows (Mayring, 2000; Seuring and Gold, 2012):

1. gathering of the material, which includes defining the units of analysis and the boundaries of the literature (content) to be analyzed;

2. descriptive evaluation, which assesses the formal aspects of the source material and sets the stage for an accompanying content analysis;

3. category placement of structural features and associated analytic classifications to be utilized on the gathered data;

4. material appraisal of the data in accordance with the (analytic) dimensions. Here, the latent content's emerging themes are developed as a way to connect underpinnings and

constructs (Khirfan et al., 2020). A key component of qualitative content analysis that enables accountability and inter-subjective provability is the categorization into distinct process phases (Seuring and Gold, 2012).

Similar to this, careful computer aid may be used during the analysis to portray associations, combination, and other qualitative data processing in the stages of content analysis to help identify data trends and relationships. Several computer-assisted qualitative data analysis softwares (CAQDAS) (such as Alteryx, NVivo, Atlas.ti, MaxQDA, Quirkos, RQDA, etc.) exist to assist in that regard. However, as a result of individual limitations, Welsh (2002) suggest combining manual and electronic qualitative methods to take advantage of the benefits of both approaches. Hence, the combination of manual and CAQDAS analyses of data is adopted in the current study.

Combining the two approaches of PRISMA model and content analysis in the evaluation of qualitative data derived from reviews, this study undertook a critical exploration and a systematic appraisal of literature to fulfil the aim of the study. The PRISMA model was adopted in the selection of existing studies and a mapping process based on content analysis was undertaken to establish the links among client satisfaction, client sophistication, and client influence in valuations.

3.0. Results And Discussions

3.1 Reviews in Determination of Client Satisfaction

Attempts are made in this sub-section to answer the pre-stated research question about the issues surrounding the application of the concept of client satisfaction based on content analysis of existing literature. The sub-section details the process of PRISMA and content analysis as well as the probable implications of findings on valuation practice.

Adopting the PRISMA model, the keyword “client satisfaction” was entered in Google Scholar, Science Direct and Primo; the results are presented in Figure 1. Entering the keyword “client satisfaction” in the databases yielded a total of 189,782 items. Then, the range of years was limited to 2001 – 2021, which limits the articles to 106,620. To refine, make more relevant to this study, and to limit the articles to manageable number, Boolean operators were used on pertinent words in addition to “client satisfaction”, viz: “valuation” (results = 29,812); “empirical” (results = 8,546); “influence” (results = 6,642), and “client influence” (results = 112). Therefore, one hundred and twelve (112) articles were subjected to individual

examination: an article not written in English was excluded; articles that were not peer-reviewed were excluded (n = 5) (the authors had a prior intention to include only peer-reviewed articles for this study); titles of the selected articles were screened and the unrelated ones were removed (n = 65); the remaining items were subjected to abstract screening and the irrelevant ones were excluded (n = 27). Thereafter, three (3) articles were found among the final selection to be duplicates and were removed. One of the articles that were instrumental to this study, Ogunba and Ajayi (2007), was discretionarily added to the final selection. Thus, a total of twelve (12) articles were subjected to content analysis in the determination of what constitute issues of client satisfaction in relation to this study. Raw data with respect to this PRISMA process are kept by the authors for reference and verification purposes.

Making judicious use of *computer-assisted qualitative data analysis software (CAQDAS) as earlier described in this study, the latest version of* Nvivo (simply called Nvivo, which supersedes Nvivo 12) was adopted in facilitating content analysis. This was in addition to manual determination of codes and careful perusal of results from the computer application to limit the shortcomings of both manual process and computer outputs (Welsh, 2002).

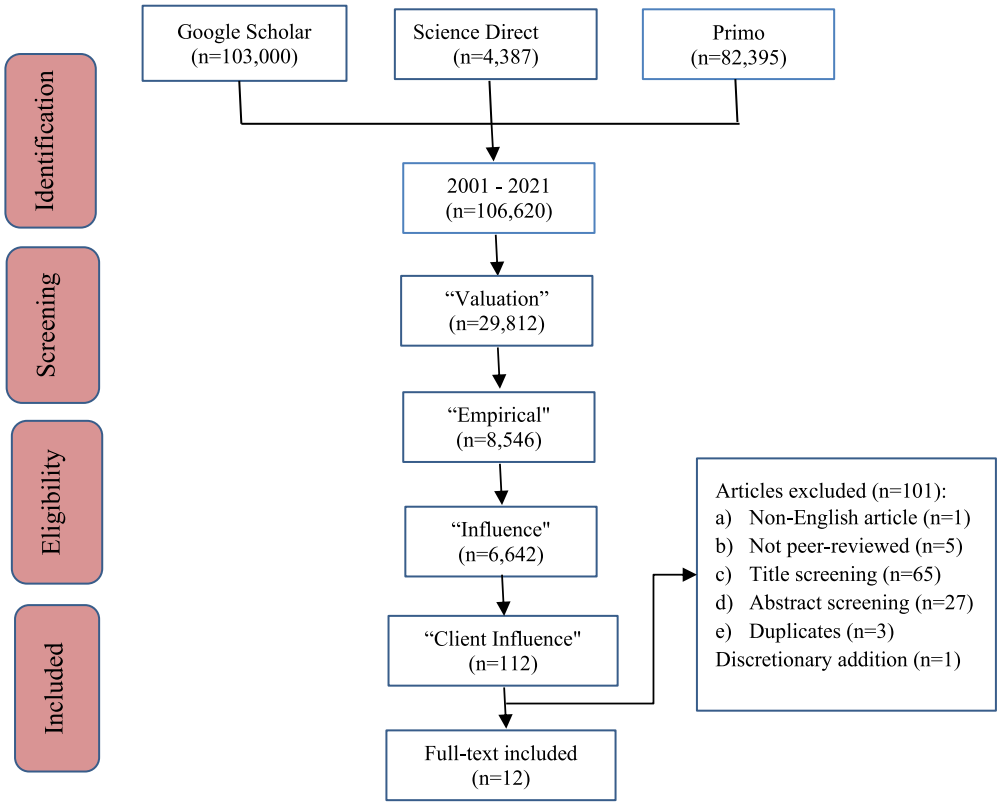
In the analysis of literature contents, codes (latent data) for identification of issues pertaining to client satisfaction were determined after preliminary review of literature on the subject of study bearing in mind the objectives of the study (Chan et al., 2015). It was predetermined that matters of client satisfaction with valuations are centred around valuation process, method, ethics, outcome and reporting. Hence, the codes for content analysis of curated papers were set as Process, Method, Ethics, Outcome and Report (see Figure 2). Latent data derived from content analysis are presented in Table 1.

With respect to Ethics, Klamer et al. (2021) reported that, even in deference to specific regulations that guide domestic real estate markets, standards of professionalism and the associated ethics surpass national limits. This is because, subject to geographical settings, valuers often betray professionalism by producing valuations to represent clients' compromising demands (Amidu and Aluko, 2007b), which is usually at the detriment of other stakeholders and public interest. According to Field (2017), in addition to abiding by governing codes of ethics, professionals should create and put into practice a philosophy to direct their ethical activities. The preference of ethical philosophy might be crucial because oftentimes, different philosophies result in different consequences for professionals (Field, 2017). Klamer et al. (2018) observed that ethical valuers endeavour to focus on protecting their decisional power over client requests for valuation alterations to portray their

autonomy and competence. Differentiating between client centredness and client alignment, Moorhead et al. (2003) opined that, advancing client interest can only be done in a substantive manner when it is subject to ethical considerations and social acceptability. **S**ocial menaces are generated by professionals acquiescing to clients on the basis of relational and financial incentives (Hellman, 2011). Public knowledge of professionals' shortcomings with respect to ethics is one of the issues of client satisfaction.

With regard to Method, Ogunba and Ajayi (2007) submitted that, clamour for refinements to valuation methods resulted from a growing number of client queries and concerns in the UK, which made it clear that the conventional investment method is becoming insufficient in facilitating progressive perspectives to decision making. Klamer et al. (2018) reported of

Figure 1: PRIMA framework in the systematic selection and review of extant studies for client satisfaction



some valuers as finding the process of detailed data gathering and deployment of contemporary valuation methods difficult and time-consuming. DCF models were considered to be excessively complicated leading to preference for the simpler conventional

investment methods. Meanwhile, clients have been observed as increasingly using more sophisticated valuation models (Boyd, 1995, p. 63; Ogunba and Ajayi, 2007). Hellman (2011) opined that, at other times, there are several situations where client requests and professional methodological advancements should align. Failure to recognise and accommodate client needs in this regard may constitute contrary issues to client satisfaction.

On Outcome, Levy and Schuck (1999; 2005) observed that prior studies indicated valuations as not being reliable estimations of market values since they are subject to systematic and random errors, leading to valuation inaccuracies and valuation variance. To clients and potential clients, professionalism should be conveyed in contexts of the necessity to

Figure 2: Chart depicting matters of client satisfaction with valuations

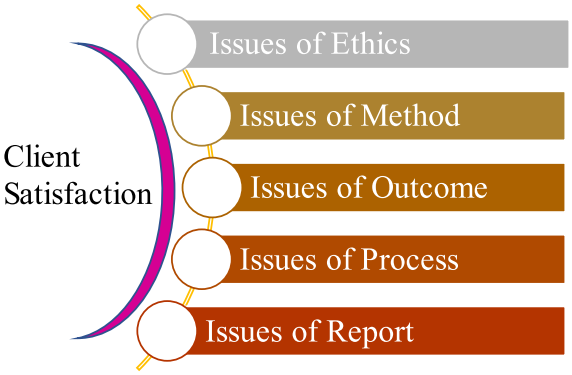


Table 1: Latent Data on Client Satisfaction

Source	Ethics	Satfcn-Method	Outcome	Satfcn-Process	Report
Klamer et al., 2021	1	3	1	6	6
Iroham et al., 2012	2	4	5	6	4
Levy and Schuck, 2005	3	2	11	39	10
Ogunbaand Ajayi, 2007	2	12	0	12	7
Field, 2017	36	1	3	9	7
Moorhead et al., 2003	5	1	17	26	9
Corredor et al., 2014	0	0	0	1	2
Segarra-Ona et al., 2020	2	1	0	19	1
Oyedeji andSodiya, 2016	0	9	1	2	9
Hellman, 2011	0	2	1	23	6
Knechel et al., 2019	1	0	20	195	23
Klamer et al., 2018	1	2	4	41	10

Source: Authors' Analysis (Crosstab Query Result, Nvivo)

independently complete all necessary steps in the appraisal process, as well as the need to consider the quality of personal judgment in order to persuade oneself and others that it is accurate (Klamer et al., 2021). Lax valuations may have a compounding effect and generate corporate economic woes, which may trigger a catastrophic crisis in national economic structures (Ajibola 2010; Oyedeji and Sodiya, 2016). Field (2017) is of the opinion that some clients are genuinely seeking unbiased assessments, even though many other clients frequently have certain preferences and desires regarding the outcome of professionals' engagements. Moreover, regulators' insensitivity and inadequacies may also contribute to issues of dissatisfaction with professionals' service offerings. Weak regulatory activities, a limitation of internal capabilities, and controllers' significantly-larger business preoccupation (Hellman, 2011) may exacerbate client dissatisfaction. While outcome is undoubtedly a major factor in satisfaction, research has shown that clients' perceptions of service professionals' procedures are not solely influenced by outcomes (Moorhead et al., 2003; Sarat and Felstiner, 1986). Subject to motives, clients do communicate their dissatisfaction with delivered valuation outcomes (Klamer et al., 2018). Clients do care about market reliability as well as accurate and realistic valuations (Levy and Schuck, 2005).

On the subject of Process, Tidwell and Gallimore (2014) noted that, private housing markets traditionally have been marked by a high cost of informational search, restricted information, heterogeneous possessions, and infrequent transactions, which may hamper effective valuation process. “Justice” done is not enough, it must be seen to have been done; hence, process problems constitute a crucial aspect in determining client-professional engagements (Knechel et al., 2019; Moorhead et al., 2003). Arising from client demands, valuers are sometimes more preoccupied with procedure and data quality than valuation outcomes (Klamer et al., 2021). Other times, valuers may have to attain tough client standards on process performance with market competence as well as complying with strict timeframes (Klamer et al., 2018). Process activities may also depend on the scope and intricacies of the professional task, as well as variations to prevailing situation (Hellman, 2011). The valuation protocol may require collecting, evaluating, and interpreting a vast quantity and variety of data, such that, without due expert diligence, inaccuracy may be introduced at any stage of the valuation process (Oyedeji and Sodiya, 2016; Wyatt, 2003). Presumably-slight adjustments to client interactions and company mechanisms may assist (Field, 2017), but without enhanced protocols, processes, and innovative products, client satisfaction, confidence, and loyalty (Segarra-Ona et al., 2020) may become a mirage to professionals.

With respect to Report, Iroham et al. (2012) informed that there are accusations of valuers

conniving with clients in disingenuously increasing mortgage value in valuation reports for higher facilities from financial institutions that provide mortgage loans. It is abhorrent practice for a professional to adopt a questionable reporting stance unless there is good cause to believe that the stance would most likely be upheld on its merits (Corredor et al., 2014; Field, 2017). In addition to additional consequences, breaking such rules should make it difficult for the practitioner to retain their line of work (Field, 2017). Professionals should carefully check their valuation report to ensure that the estimated value is reliable and backed up by the information analysis presented within (Klamer et al., 2021; Oyedeji and Sodiya, 2016). Clients who can constructively evaluate if the results they obtained were satisfactory may be able to fairly evaluate critical facets of a professional's competency (Moorhead et al., 2003). Client satisfaction may depend on professionals' provision of robust valuation assessments that inspire confidence, which is demonstrated by the presentation of compelling valuation reports that are well-grounded and foster proper comprehension (Klamer et al., 2021).

The foregoing discussion presents the determination of what may constitute issues of client satisfaction with respect to this study. Clients' demand for improved accuracy and consistency in valuations; clients' demand for transparency, rationality, and reliability in valuation techniques; and the paucity of relevant market data as well as other market imperfections may comprise issues of client satisfaction in valuations.

3.2 Reviews in Determination of Client Sophistication

In this sub-section, the research question about what constitutes client sophistication based on content analysis of existing literature is presented. The process of PRISMA and content analysis as well as the likely implications of findings on valuation practice are examined.

Using the PRISMA framework, keyword “client sophistication” was subjected to search in Google Scholar, Science Direct and Primo; the numbers of generated articles are presented in Figure 3. The keyword “client sophistication” produced a total of 1,176 articles. Then, the range of years was set to 2001 – 2021, which refined the outputs to a total of 818 articles. In order to delimit to sizeable, yet, relevant number of articles, Boolean operators were used on related words in addition to “client sophistication”, such as: “valuation” (results = 239), and “empirical” (results = 73). Thus, seventy-three (73) articles were subjected to further screening for eligibility: articles that were not peer-reviewed were excluded (n = 12); title screening led to removal of unrelated articles (n = 31); abstract screening was conducted on the remainders and the irrelevant articles were excluded (n = 23). Thereafter, two (2) articles were found to be duplicates and were removed; the full text of another article (1) was

inaccessible and the article was dropped. Because of the paucity of the final selection, five (5) other articles, which were earlier screened out in the course of using the Boolean operators ("") but whose full texts were found to be very relevant to this study, were discretionarily added. Hence, a total of nine (9) articles were selected for content analysis in arriving at the features of client sophistication in relation to this study. The raw data of this PRISMA process are kept by the authors for proofs and checks.

Using the Nvivo CAQDAS, codes (latent data) for arriving at what constitute client sophistication were based on prior review of literature on the subject of study bearing in mind the objectives of the study (Chan et al., 2015). The features of client sophistication were found to border around client requirements (demands), expertise, experience, method and power. As such, the codes for content analysis of selected papers were termed Demand, Experience, Expertise, Method, and Power (see Figure 4). After the content analysis of selected literature for this sub-section, the numbers of references to the codes are presented in Table 2.

With respect to Demand, Ogunba and Ajayi (2007) reported that improved accuracy, being more rational, and performing risk analyses are three ways that client requirements are evolving. The authors researched that, during the past 50 years, the UK valuation industry has developed and advanced its valuation methodology in response to shifting client expectations. The authors further advised that, for valuation practice in Nigeria, there is need to build cognisance, refine valuation texts, empower valuers and develop valuation standards in compliance to contemporary client requirements. Levy and Schuck (1999; 2005) differentiated between sophisticated and unsophisticated clients in their demands on valuers in New Zealand. However, the authors observed that valuers' response to the compromising demands of such clients will determine whether the valuers are ethical or otherwise.

By sophisticated tendencies, clients may induce valuers to comply with compromising demands to bias valuations; which may be associated with threats of paying-client retention and business survival (Amidu and Aluko, 2007a). Moorhead et al. (2003) submitted that, clients have knowledge that is both greater and lesser than what the literature suggests; as such, professionals must adopt approaches to keep their proficiencies, including technical and independent means of quality assurance. Oyedeji and Sodiya (2016) observed that clients are now considerably more sophisticated and data-driven in their decision-making techniques, and as a result, progressively need more accurate and consistent assessments from their valuation consultants. Additionally, investment portfolios are taking on global

proportions as a result of globalization. Therefore, all professional activities must adhere to global trends and requirements of arising from sophistication (Ogunba and Ajayi, 2007). Other studies, including Oladokun and Mooya (2020), also reported about client demands with respect to client sophistication.

With regard to Experience, Garry and Harwood (2009) submitted that, one of the major determinants of client sophistication is their experiential knowledge. Though some clients might well have very minimal professional service experience, others may have worked in a variety of capacities with private practice companies preceding getting appointed and recruited "in-house" with corporate organizations. Levy and Schuck (2005) observed that the client is a significant contributor of experience to the valuer in certain circumstances. According to the study, all client-interviewees indicated that they were inclined to deploy their experience to help valuers with the valuation process (Levy and Schuck, 2005). The participation, perspectives, actions, drive, charisma, experience and product knowledge of

Figure 3: PRIMA framework in the systematic selection and review of existing studies for client sophistication

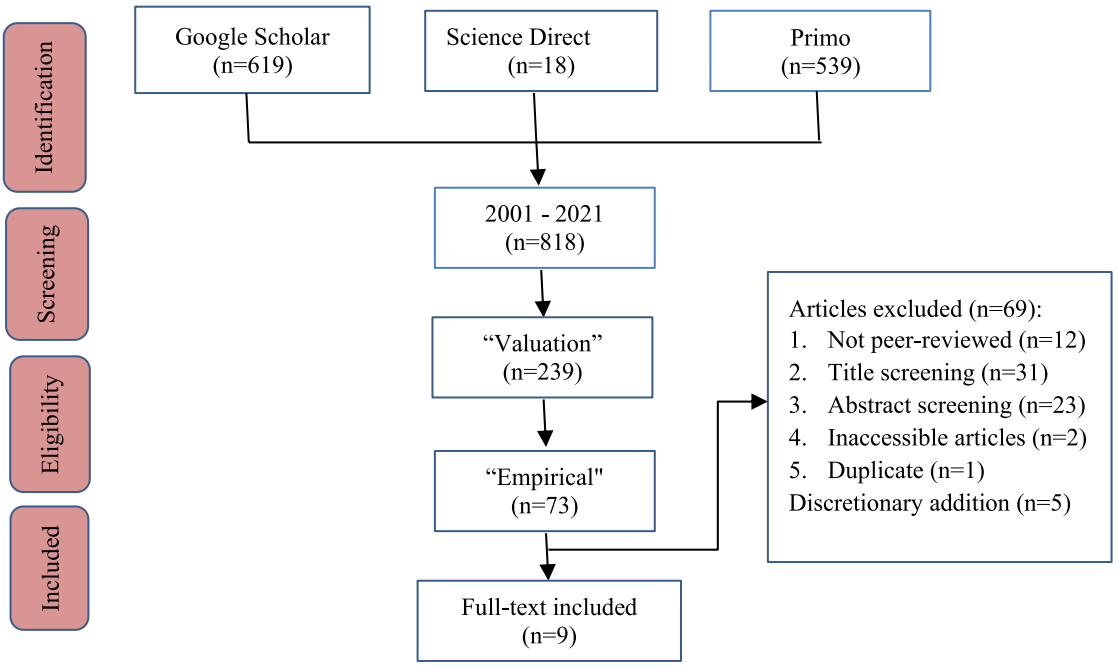


Figure 4: Chart depicting matters of client sophistication in valuations

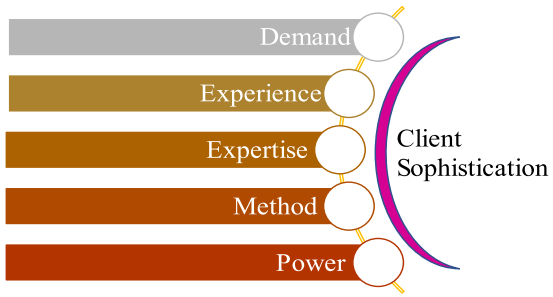


Table 2: Latent Data on Client Sophistication

Source	Demand	Experience	Expertise	Sophcn-Method	Power
Levy and Schuck, 2005	0	9	14	2	32
Ogunbaand Ajayi, 2007	2	3	3	12	0
Oladokun and Mooya, 2020	9	13	1	2	1
Koslow et al., 2006	2	2	6	4	7
Babawale andOmirin, 2012	0	17	0	7	0
Garry and Harwood, 2009	7	2	9	1	11
Liu, 2010	2	8	5	1	4
Ayodele, 2019	7	12	6	11	0
Amiduand Aluko, 2007a	5	15	2	1	2

Source: Authors' Analysis (Crosstab Query Result, Nvivo)

clients, as well as their engagement with environmental influences, may result in their sophistication (Liu, 2010). For sophisticated clients, product and service experience - the history of prior use in relation to a latest procurement decision - is of utmost importance (Sauer, 1998; Liu, 2010). Clients do assess valuation accuracy and consider valuation reports in line with regulatory criteria as outlined in established procedures and standards (Klamer et al., 2021). Their experiential knowledge may impose on the professionals the needed carefulness to ensure rational explanation of appropriate methods so as to produce valuation reports that meet criteria for acceptance (Klamer et al., 2021).

On Expertise, Garry and Harwood (2009) observed that, the client sophistication spectrum in the services sector today ranges from individuals and small owner-managed businesses to major, highly sophisticated clients with in-house professionals. Resulting from this is that clients may have the capacity to formulate expectations and performance analyses regarding services delivery and may have the requisite technical skills and qualifications that grant them

the necessary competence (Garry and Harwood, 2009; Hanlon, 1997).Liu (2010) submitted that there are seven dimensions of a sophisticated consumer: search efforts, knowledge, experience, product expertise, brand consumption, best decision, and technology adoption with innovativeness. Through expertise and product knowledge, it appears that sophisticated clients endeavour to educate themselves on the service or product even before actual procurements. Sophisticated consumers are more invested and analyze information more meticulously and comprehensively (Liu, 2010). Studies have also shown that customer interaction may be necessary to produce crucial knowledge, competences, loyalty, innovation and improvement of services (Hardyman et al., 2015; Segarra-Ona et al., 2020).In conjunction with client expertise and involvement, service firms may then increase their capacity to produce new products or processes; remove obsolete products or processes; establish new or noticeably enhanced methods of service delivery (Koslow et al., 2006; Segarra-Ona et al., 2020).

Also, clients may be in position to share their subject expertise with valuers. In Levy and Schuck's (2005) study, all respondents possessed a significant level of expertise and knowledge about the real estate markets they were participating in. The interviewees indicated that they were inclined to apply their knowledge to support the valuation process, particularly in spotting inaccuracies and inconsistencies while assessing draft valuations (Levy and Schuck, 2005). Subject to motives, clients with expertise and a high level of knowledge of the property market are able to influence valuers to do what they think is right. Klamer et al. (2021) informed that client service and performance evaluation specificity may make it a challenge for valuers to deliver requisite reporting excellence. More particularly, this relates to the measure to which regulatory obligations as outlined in procedures and standards will be met by valuation reports. According to Moorhead et al. (2003), professionals may occasionally have clear advantages over clients due to their position and specialized knowledge, which limits the clients' capacity to interact on an equal footing. But other times, clients could indeed determine if the outcomes they obtained were commensurate with standards - such clients are rightfully able to appraise critical attributes of the professionals' expertise (Moorhead et al., 2003).

On the subject of Method, Ogunba and Ajayi (2007) noted that, while clients were deploying and requesting advanced valuation techniques, concerns about the statistical difficulty of the methods and their computer programming necessities were raised among professional valuers. The need for valuers to meet the growing demand of clients, who frequently use more advanced analytic techniques than their consultants, has been observed and recommended by authors (Boyd, 1995, p. 63; Ogunba and Ajayi, 2007; Ayodele, 2019). In Levy

and Schuck (2005), the most of clients consistently criticized the valuers' valuation techniques because they believed they did not adequately reflect the market for commercial real estate. The authors noted that the respondent-clients were experienced in the usage of various valuation methodological approaches and majority had forceful perspectives regarding the methodologies they intended to be utilized in the valuation of their portfolios. One of the tokens of the clients' sophistication was in tasking valuers to justify their adoption of particular valuation approach (Levy and Schuck, 2005). Market complexities do impact valuers' efforts to differentiate themselves through some positioning tactic, including the prompt presentation of sophisticated yet very well-expressed valuation reports devoid of laxity (Babawale and Omirin, 2012; Klamer et al., 2021).

With respect to Power, Liu (2010) informed that information is now readily accessible to any customer with Internet access or smartphone, changing the landscape of the conventional market. The author opined that, businesses that realize and comprehend the nuanced wishes and desires of sophisticated customers can properly handle and channel the newly discovered power of such class of clients. Clients' sophistication sometimes makes them to be overbearing. The client-professional relationship may end if there was a recognized abuse of power, such as imposing fees, demanding further services without payment, and such likes (Garry and Harwood, 2009). Similarly, the relationship among professionals, clients and the society involve the interplay of expert power, social power, and economic power (Garry and Harwood, 2009; Parker, 1997). Some clients have the ability to influence valuers by using expert power because of their subject-matter expertise (Levy and Schuck, 2005).

Apart from expert power, there are information power and economic/reward/coercive power deployed by clients depending on the level of their sophistication (Amidu and Aluko, 2007a; 2007b; Iroham et al., 2012; Kohli, 1989; Levy and Schuck, 1999; 2005; Pasewark and Wilkerson, 1989). When a client holds clout resulting from mastery of real estate and valuation techniques, this is known as expert power. Coercive/reward/economic power indicates their authority over repeat businesses and payments of fees, whereas information power relates to their possession of material facts and data that are pertinent to valuations. As a result, valuers may subject professionalism to relational reward and coercive power for the sake of client retention (Klamer et al., 2021).

The reviews above detail the determination of the concept of client sophistication. It does appear that, client requirements (demands), experience, expertise, valuation methods, and power comprise client sophistication. Arguably, the increasing emergence of more sophisticated, growth-explicit, and cross-disciplinary investment valuation (and statistical)

models; valuers' incapacity to adapt and adopt “difficult” computational models; as well as clients' subject expertise, experience, and power reflect the level of client sophistication.

3.3 Reviews in Determination of Client Influence

In this sub-section is presented the manifestations of client influence based on content analysis of existing literature. The process of PRISMA and content analysis as well as the plausible implications of findings on valuation practice are reported. For the PRISMA process, the outcome is presented in Figure 5.

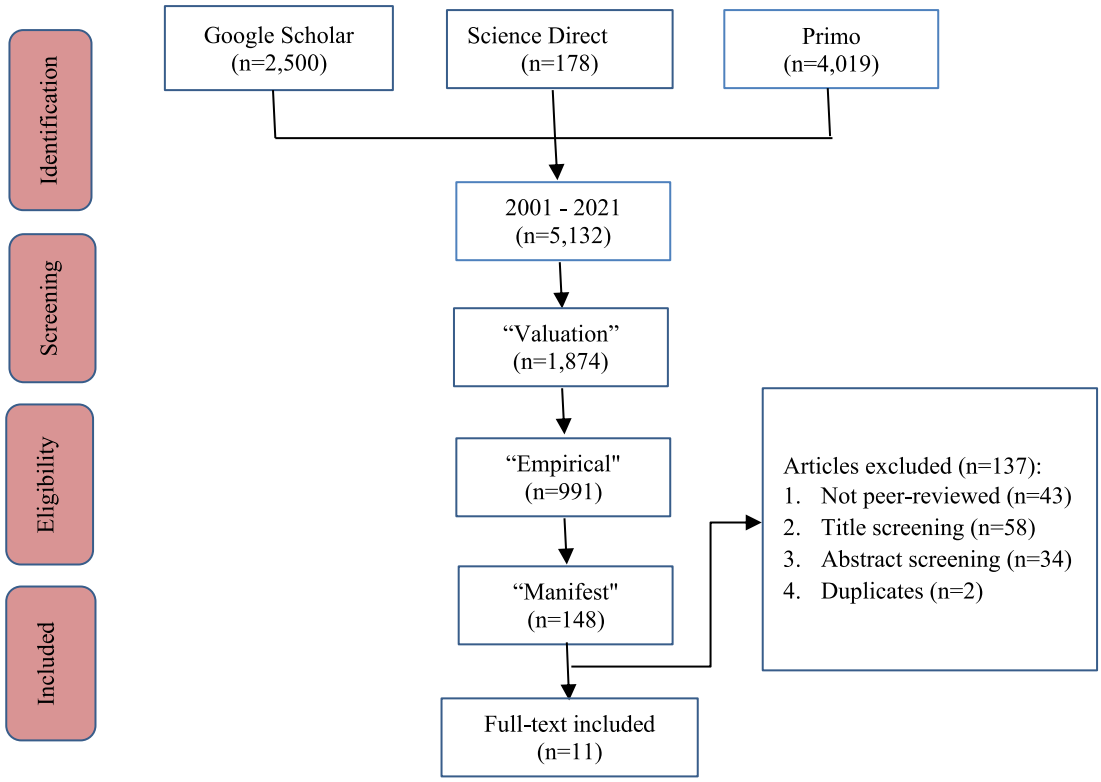
Entering the keyword “client influence” in the databases yielded an initial total of 6,697 articles. Repeating the process as it was done in the last two sub-sections led to the final selection of eleven (11) articles for content analysis in determining client sophistication in relation to this study. The raw data detailing the PRISMA process of this sub-section are also kept by the authors for reference purposes.

With the use of Nvivo, codes (latent data) for examining issues of client influence were premised on preceding review of literature on the subject of study and the objectives of this study. Matters of client influence were discovered to comprise valuation fees, information, instruction, process and result (outcome). Therefore, the codes for content analysis of carefully chosen papers were set as fees, information, instruction, process, and result (see Figure 6). Results of the content analysis of curated literature for this sub-section are presented in Table 3.Client influence describes the involvement of clients in valuation to sway the valuer's judgment and prejudice the valuation. According to Crosby et al. (2010), it involves the client manipulating the valuation process in order to methodically and subjectively influence the valuation outcomes. The spate of clients' influence in valuations is a worldwide phenomenon (Kinnard, et al., 1997 in the US; Baum et. al., 2000; Crosby et al., 2004 in the UK; Levy and Schuck, 1999; 2005 in New Zealand; Yu, 2002 in Singapore, Amidu and Aluko, 2007a; 2007b; Ogunba and Iroham, 2011; Iroham et al., 2012 in Nigeria).

With respect to Fees, Garry and Harwood (2009) reported that, fees charged and their negotiation are a crucial factor when it comes to clients with the applicable degree of proficiency. Because of the level of competition in the valuation industry, a valuer may be forced to grant their client's inappropriate requests. These demands can concern fee negotiations or other matters that the valuer thinks the client cares about (Amidu and Aluko, 2007b; Levy and Schuck; 2005). Client influence may also be characterized by the motives of clients and valuers, which may rely on the blend of impetuses and each party's unique stance, including the proportion of revenue a valuer makes from a particular client (Amidu and Aluko,

2007b; Levy and Schuck, 2005; Smolen and Hambleton, 1997).Power over subsequent valuation instructions gives clients the chance to use their influence to encourage or compel a valuer to produce an "acceptable" result (Levy and Schuck, 2005). Also, in order to sustain revenues and retain clients in intensely competitive local markets, there are indications that valuers undercut professional fees (Amidu and Aluko, 2007a). Ability to work independently

Figure 5: PRIMA framework in the systematic selection and review of extant studies for client influence



and free from inappropriate influence may conflict with keeping clients who have strong perceptions about "acceptable" results (Klamer et al., 2021; Spence and Carter, 2014).

Owing to the intense competitive environment in the industry, valuers often seek to differentiate themselves through pricing and the establishment of strong client relationships in order to maintain preferred business arrangement (Amidu and Aluko, 2007b; Klamer et al., 2021). Amidu and Aluko (2007b) stated that a valuer's participation in additional consulting work for a client is capable of influencing the valuer's opinion regarding valuation assignment for that client. In order to get valuers to accomplish what they want, clients may offer

increased fees or assurances of extension of future consultation, according to Iroham et al. (2012). However, valuers who work for large firms are more likely to withstand client pressure than those who work for small ones - probably due to their annual turnover (Amidu and Aluko, 2007b). Other studies including Dee et al. (2006), Quick and Warming-Rasmussen

Figure 6: Chart depicting matters of client influence in valuation

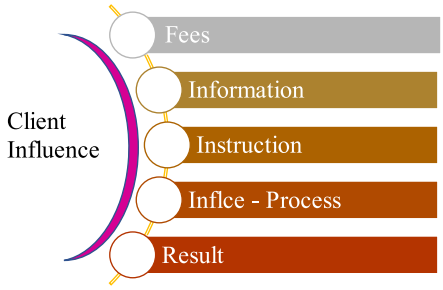


Table 3: Latent Data on Client Influence

Source	Fees	Information	Instruction	Inflce-Process	Result
Klamer et al., 2021	2	9	5	6	1
Quickaand Warming-Rasmussen, 2005	26	19	0	2	12
Tidwellaand Gallimore, 2014	0	53	1	28	9
Tugui et al., 2020	2	17	0	39	8
Misra et al., 2020	0	120	1	20	8
Dee et al., 2006	58	1	0	0	6
Bobek et al., 2010	5	20	1	23	3
Nwubaand Salawu, 2017	0	4	0	3	4
Kleinman et al., 2012	4	21	0	6	10
Iroham et al., 2012	2	11	1	6	4
Amiduand Aluko, 2007b	0	5	0	7	0

Source: Authors' Analysis (Crosstab Query Result, Nvivo)

(2005) also raised observations about fees and professional independence with respect to client influence.

With regard to Information, Levy and Schuck (2005) submitted that the client is a significant source of information to the valuer. As a result, clients can influence valuers through information by supplying whatever they deem to be pertinent information (Levy and Schuck, 2005; Nwuba and Salawu, 2017). Some clients may engage in the valuation process

presumably to provide inputs that would help the valuer achieve a realistic valuation, even though some clients may provide biased valuation information to their valuers (Nwuba and Salawu, 2017). Also, by lowering the mental efforts required for making decisions, informative displays may affect the decision-making procedure undertaken by valuers (Tidwell and Gallimore, 2014). Because they help to manage how information is presented and support the valuer in gathering and processing reliable information, decision support systems are necessary for enhancing and debiasing the valuer's decision-making (Tidwell and Gallimore, 2014). Besides, resulting from client influence, a RICS-commissioned study (Carsberg, 2002) suggested reforms to the way the RICS advised valuers in the engagement between clients and valuers to enhance transparency whenever the clients are giving information critical to the valuation (Iroham et al., 2012). Kleinman et al. (2012) and Misra et al. (2020), among other studies under this sub-section, also raised pertinent issues with regard to information and the influence of clients.

On Instruction, Moorhead et al. (2003) observed that the process of engaging with clients plays a significant role in the paradox of professional-client relationships. As they interact with professionals in the course of presenting instructions, clients exert some power over professionals (Moorhead et al., 2003). Levy and Schuck (2005) noted that the instruction process is one of the avenues adopted by clients in influencing valuers to do their bidding. Clients have the chance to "opinion-shop" a valuer before giving them instructions (Levy and Schuck, 2005); affording them the opportunity to find one that will succumb to the intended influence. Klamer et al. (2021) observed that some clients commonly requested a selection of valuers to send-in instruction proposals in direct competition with one another. Along with information analysis, making fair decisions premised on rationality, data accessibility, and experience, valuers are expected to observe client instructions while executing the valuation process (Amidu and Aluko, 2007a).

On the subject of Process, Levy and Schuck (2005) remarked that clients have a stringent grip over the valuation process, enabling opportunities for influence. This is so that the clients have the option of selecting individual valuers they think will share their stance with respect to valuation approach. Levy and Schuck (2005) noted in their study that clients had specific inclinations on how valuations ought to be conducted and would only engage valuers who they believed used a methodology that "accurately" reflected the open market. The clients asserted that, notwithstanding this, their participation in the valuation process demonstrated their desire to promote market transparency, consistency, accuracy, and rational valuations (Levy and Schuck, 2005).While some clients' assessments may have an

impact on how valuers perceive their roles, others' inputs may be intended to reinforce standard conducts (Iroham et al., 2012). Moreover, the possible effects of mercantile and bureaucratic process on valuation quality may lead to official and academic misgivings about the implications of judgment bias (Klamer et al., 2021). Other studies, such as Bobek et al. (2010) and Tugui et al. (2020), also raised concerns about process within professionals' services with regard to client influence.

With respect to Result, Iroham et al. (2012) submitted that, although it is typically anticipated that the valuation opinion comes from an unbiased assessment of interplay of the factors of demand and supply (and price movement) in connection with real estate, clients can have an influence on the output of the valuation process. Amidu and Aluko (2007b) reported that, valuers who are handling different tasks for one client are mostly inclined to collude with them in order to create inflated values and biased valuation results. Levy and Schuck (2005) observed that, the practice of submitting draft valuations to clients for reviews before their formalization increases the possibilities and opportunities for client influence in New Zealand. Amidu and Aluko (2007a) supported that, the impartial valuation process may be impacted by client influence, especially when it is explicit and manifests as a request for adjustments to be made to original valuation figures in order to accommodate clients' intended uses. Freedom to work independently without excessive influence may conflict with keeping clients who have differing viewpoints about what constitutes "acceptable" outcome (Klamer et al., 2021; Spence and Carter, 2014). According to Nwuba and Salawu's (2017) findings, valuers opined that client influence compromises their integrity, the integrity of the valuation firm, and the integrity of the valuation practice. They also believe that it discredits their expert knowledge and limits the growth of the valuation industry. Nonetheless, Levy and Schuck (2005) added that not every influence of client is necessarily aimed at bias against market values; contingent on the objective of the valuation, client motivations hold true to influence valuations in the direction of market values.

Through the reviews above, attempts have been made to establish the concept of client influence. Judging from the reviews, issues of client influence does tend to revolve around valuation fees, information, instruction, process and result (outcome).

3.4 Determination of Isomorphism

Attempts are made under this sub-section to answer the other major research question of correlations in the issues and the application of the concepts of client satisfaction, client sophistication and client influence by existing literature. In this study, isomorphism is determined by attempting a mapping of the collated literature on each concept of study

based on content analysis. In other words, the paper examines whether the clients' reported issues, bordering on satisfaction with valuation practice, when put together with trappings of client sophistication amount to their desires to continuously influence the valuation process and outcome – whether positively or negatively. To examine this, Pearson correlation coefficient, cluster analysis, and dendrogram presentation were determined as the reasonable options for presenting the isomorphism of the three concepts of study. Extant studies have already undertaken the application and presented the applicability of these techniques in qualitative data analysis and these options (among others) are available in Nvivo CAQDAS (see Chan et al., 2015; Chan et al., 2014; O'Neill et al., 2018).

Resulting from adopting the technique of Pearson correlation coefficient on codes derived from reviews, made of content analysis of the selected literature which were earlier examined in the previous sections, associations can be examined. With Pearson correlation coefficient, the closer the value is to 1, the higher the similarity of the pair (or dissimilarity, −1) and when the value is zero, no linear relationship exists between the pair of items. Nvivo outputs in this regard are presented in Figure 7 and Table 4. The table shows the coefficient per pair of items.

Results show that there is a significantly positive linear relationship among the three concepts. The pair of client satisfaction and client sophistication have coefficient of 0.64897. It does appear that the issues that make up client satisfaction (valuation outcome, ethics, method, report and process) can be associated with the features of client sophistication (power, expertise, demand, experience, and method). The correlation is observable and explainable by extant literature.

Liu (2010) opined that, customers who display evidences of sophistication, such as greater participation, expertise, and experience, may also show greater loyalty, dedication, and satisfaction. According to Klamer et al. (2021), market competition does compel valuers to pursue uniqueness strategies, such as prompt delivery of sophisticated (yet, well presented) valuation reports that are free of ineptness and simple to comprehend, in order to gain client satisfaction. Some valuers perceive that professionalism is best understood in contexts of the necessity of carrying out all applicable steps of the valuation process without undue client involvement, as well as the need to consider the reliability of one's professional judgement in order to convince both oneself and the clients that it is accurate (Klamer et al., 2021). More so, tough market competition sometimes makes valuers work toward developing close connections with clients so as to "satisfy the client well", and for the retention of advantageous business relationships (Klamer et al., 2021).

Then again, as depicted in Table 4 with coefficient of 0.70135, issues of client satisfaction seem to have a significant association with the manifestations of client influence. This suggests that some of the complaints of clients, with respect to valuation process and outcome, may be resulting from their own interference with valuers' intention of undertaking the valuation process through the normative process and standard requirements. Moreover, this can be reasonably observed in existing studies.

Klamer et al. (2021) stated that, in the midst of client influence, valuers' cautious position is that client satisfaction is critical to business's gainful survival. Nevertheless, professionals exist, not just for individual clients but to undertake tasks conscientiously; bearing at heart the overall benefit of the society. Theoretically, a profession's survival rests on its capacity to find solutions that are both practically and socially meaningful to its clientele and to society at large (Moorhead et al., 2003). Furthermore, clients decry inaccurate and inconsistent valuations, but their contribution to the disruption of the normative tendencies of valuers

Figure 7: Dendrogram of cluster analysis

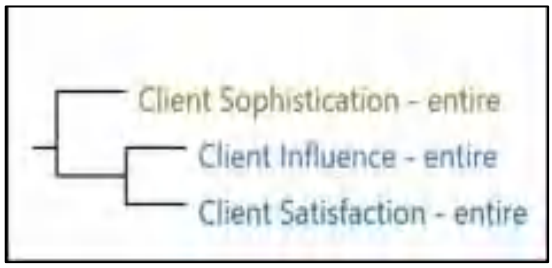


Table 4: Correlation of the Concepts

Concept (Code)	Concept (Code)	Pearson correlation coefficient
Client Satisfaction – entire	Client Sophistication – entire	0.64897
Client Satisfaction – entire	Client Influence - entire	0.70135
Client Sophistication – entire	Client Influence – entire	0.62558

Source: Authors' Analysis (Pearson Correlation Coefficient, Nvivo)

has been registered in the literature. One of several reasons for inaccurate valuations is client influence (Ajibola, 2010; Babawale and Omirin, 2012; Klamer et al., 2017; Ogunba and Iroham, 2011; Nwuba and Salawu, 2017). Probably relegating ethical considerations and the

independence of the professionals, some clients may consider the valuation service as a "buyer-seller" relationship. According to Hellman (2011), sometimes clients relate to their relationship with auditors as one between a customer and a supplier, seeing themselves as speaking for the paying client who is “entitled" to obtain “value” for their money.

Similarly, as presented in Table 4, the pair of client sophistication and client influence have a coefficient of 0.62558.The implication is that, there may be a direct link between those issues that make up client influence (valuation instruction, fees, result, process and information) and the aspects of client sophistication. It does appear that the more sophisticated clients are, the more influence they can bring into the valuation process. This form of isomorphism can be explained by prior research works.

Levy and Shuck (1999; 2005) reported that client sophistication affected the sorts of influence that clients had on valuers. Information is used by sophisticated clients to sway valuers. Methods include highlighting attractive aspects of a property, omitting unfavorable details, and providing selective market data. Unsophisticated clients frequently resort to coercive measures like threat of withholding payment of fees or further business engagements. Several studies also posited that "client power", which is a reflection of client sophistication, leads to client influence (Amidu and Aluko, 2007a; 2007b; Iroham et al., 2012; Klamer et al., 2021; Levy and Shuck, 1999; 2005). The "power" available to clients, such as the reward/coercive power, expert power and information power, are usually employed to sway the perspectives of valuers and influence valuations. Sometimes, higher fees and promise of future engagements are proposed to make valuers submit to client influence.

Moreover, valuers consider that client influence restricts the growth of the valuation practice and undermines the integrity of the valuer, the valuation firm, and that of the profession (Nwuba and Salawu, 2017). In the event that client requests that valuation figures be adjusted, valuers must concentrate on maintaining their discretionary authority over changes in order to highlight their independence and competence (Klamer et al., 2018). Client contribution is the antithesis of client influence in valuations; hence, Nwuba and Salawu (2017) opined that regulatory bodies should reassess the standards for valuation practice in order to put in place mechanisms to prevent the unpleasant complexities arising from client participation in valuations.

Therefore, as depicted in Figure 8, this study suggests that there is more to client influence in valuations. In their attempts at addressing the issues of client satisfaction, valuers (and appraisers) must ethically and conscientiously “draw clear lines” against undue influence and interference of clients while executing the valuation process.

4.0. Study Limitations

This study is based on information derived from the review of literature. The results are arguably subject to bias because they are based on authors' qualitative coding and analysis of literature data; however, they have been reported in a manner that should allow readers to assess the appropriateness of the conceptions and categorisations made (see Hellman, 2011).

As a qualitative study, the aim is not to make any generalization whatsoever, but to build on theory. Field survey and reporting of what obtains in practical valuation process and in the study of client-valuer relationships may not be accurately predicted based on computer outputs. Together with the application of CAQDAS, this study is meant to provide a reasonable trajectory for empirical studies on the subject matter. The results of empirical research on the subject are likely to have more critical implications for local investment valuations.

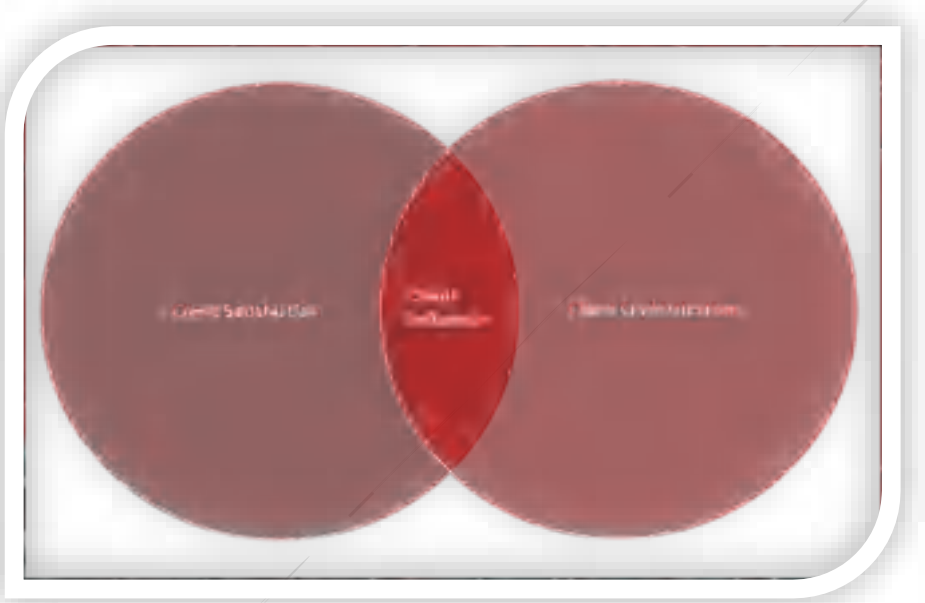
5.0. Conclusion

As an offshoot of behavioural research, this paper provides a significantly new perspective on client influence in the activities of valuation practitioners. The paper found that client satisfaction, as revealed by issues such as valuation outcome, ethics, method, report and process are directly related with the features of client sophistication such as power, expertise, demand, experience, and method.

The study found that some of the complaints of clients, with respect to valuation process and outcome, was an expression of their satisfaction or otherwise, which was a form of interference with valuers' valuation process. In addition, the study also found a direct link between those issues that make up client influence (valuation instruction, fees, result, process and information) and the aspects of client sophistication, suggesting that the more sophisticated clients are, the more influence they could bring into the valuation process.

In conclusion, valuers are surreptitiously subjected to client influence and compromise through client sophistication in their quest to obtain client satisfaction while undertaking valuations. This assertion will either be substantiated or rebuffed by empirical findings of the ongoing research on the subject matter in Nigeria.

Figure 8: Venn diagram of the Concepts



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BENCHMARKING ZIMBABWE'S GLOBAL COMPENSATION AGREEMENT AGAINST THE PROVISIONS OF EXISTING LAWS GUIDING COMPENSATION FOR EXPROPRIATED PROPERTIES

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Abstract

The government of Zimbabwe (GoZ) and former commercial farmers signed a highly celebrated historic Global Compensation Agreement in July 2020. This Global Compensation Agreement which is a product of the new administration was signed following adoption of a consensus-based compensation. Even though the Global Compensation Agreement document remains a guarded secret, parties to the agreement shared the process which resulted into the agreement and limited contents of the Global Compensation Agreement. Currently, no known study has been conducted to assess whether the process which was used to estimate the global compensation and the provisions of the Global Compensation

Agreement comply with the provisions of the existing laws. As such, this study was carried out to close this gap and contribute to the existing debate on compensation expropriated for land reform in Zimbabwe. A desktop survey was used, and data were obtained mainly online. It was concluded that even though the Global Compensation Agreement was done as guided by the *Land Acquisition Act (LAA*) of 1992 and the *Constitution of Zimbabwe (CoZ)* of 2013, specially on the compensable heads of claim and the compensation period. However, an institutional framework which was used to arrive at the GCA seems to have deviated from the provisions of the same laws. This study was limited by unavailability of a copy of the Global Compensation Agreement document resulting in the researchers only using the little information which was published by parties to the Global Compensation Agreement. It is recommended that further research be done on the same area once the Global Compensation Agreement deed is published.

1.0. Introduction And Background

When Zimbabwe attained its independence from colonial rule in 1980, it adopted a compensation framework based on market value for land compulsorily acquired during the colonial era. However, this compensation framework just lasted for a decade when it was dumped due to the beliefthat it was stifling the pace of land resettlement (United Nations Development Programme (UNDP), 2002; Madhuku, 1999; Magaisa, 2010). Fair compensation was adopted instead of market related compensation during the period between 1990 to 2000 (Moyo, 2000; De Villiers, 2003; Moyo, 2006; Chivandi, Fushai & Masaka, 2010; Magaisa, 2010).

From the year 2000, the government of Zimbabwe decided to fast track the land reform processesby expropriation without compensation for land (De Villiers, 2003; Moyo, 2006; Pazvakavambwa & Hungwe, 2009; Magaisa, 2010; Moyo, 2016). As a result, there was a compensation dispute between displaced commercial farmers and the government of Zimbabwe which spanned for 2 decades. This compensation discourse changed in 2017 when a new government came into power after 37 years of rule by the second president of the Southern African country. The coming in of the new administration brought with it new hope for the former commercial farmers as it indicated its willingness to solve the compensation dispute amicably (Bratton, 1987; Alexander, 1993; & Pilossof, 2016). In July 2020, the GCA agreement was signed between disputing parties with the aim of bringing a closure to the compensation dispute (Ministry of Finance and Economic Development, 2020; Ncube, 2020).

Yacim, Paradza and Zulch (2021) concluded that there are glaring gaps when the compensation process in Zimbabwe is measured against the principles of procedural fairness. Other studies on compensation for expropriation in Zimbabwe noted inconsistencies in the process (Paradza, Yacim & Zulch, 2021; Yacim, Paradza & Zulch, 2022) as such the authors linked inconsistencies to lack of fairness resulting in protracted compensation disputes. This might be the reason why displaced former commercial farmers were not satisfied with the Global Compensation Agreement as noted by Zulch, Yacim and Paradza (2022). Despite the above-mentioned flaws of the local laws and the compensation processes, the Global Compensation Agreement was done as prescribed by the local laws (Ncube, 2020; Orphanides, 2020).

However, very little is known about how the GCA complied with the provisions of existing compensation laws. Thus, the purpose of this study is to critically compare the GCA against the provisions of existinglaws guiding compensation for expropriated land. Therefore, the focus of this paper is limited to comparing the Global Compensation Agreement to the provisions of local laws. A comparison of both the Global Compensation Agreement and local laws with international best practice is outside the scope of this paper.

2.0. Literature Review

There is vast literature on laws guiding compensation for expropriated properties across the world. Arul Vikram and Murali (2015) reviewed the Indian legal frameworks relating to valuation or assessment of compensation for expropriation in comparison to Indonesia, Nigeria, Malaysia, Bangladesh, Trinidad & Tobago, Slovenia, Mali, Nanjing, and Vietnam. The content analysis was used to compare or benchmark their statutes. The study concludes that the Indian legal frameworks lacked (1) a guideline on proper identification of the displaced persons, (2) a defined formula for the assessment of compensation, and (3) a provision for prompt payment of compensation to affected people.

Ghimire, Tuladhar and Sharma (2017), gauged the expropriation and compensation assessment guidelines designed by the Food and Agriculture Organisation (FAO), and the World Bank, to those of China, India, Malaysia, Nepal and Norway. The study employed specific set parameters for assessment, including transparency, public participation, benchmarking, and access to information. It was discovered that lack of consistencies to the stated criteria was seen among countries, apart from Norway. The implication was for the other countries to develop sound principles in their expropriation and compensation

practices. Thus, an inference from the study is that though countries are at liberty to design, country-specific expropriation and compensation laws, this must be in line with the international best practice.

In a related study, Tagliarino (2017) compared the statutes that guide property valuation for payment of compensation for expropriation in fifty (50) countries, across three continents (Africa, Asia and Latin America) relative to the FAO guidelines. The study concluded that because of the differences in their legal provisions, assessment of compensation is dissimilar across the countries. While the study advocates for a uniform legal framework for expropriation and compensation across all countries of the world, the findings revealed that country-specific laws on the subject matter still hold sway.

Olanrele, Alias, Said and Bello (2017) compared the legal frameworks guiding property valuation for compensation in Nigeria with those of the United Kingdom, Denmark, United States of America, Australia, New Zealand, Hong Kong, Malaysia, South Africa, and Rwanda. Again, this study used some parameters or variables including compensable heads of claim, compensation principles as well as the basis of valuation, and found that land, buildings, crops, severance, and disturbance are compensable heads of claim.

In Zimbabwe, Madhuku (1999) and Magaisa (2010) gave a historical overview of expropriation laws in Zimbabw. Also, scholars like De Villiers (2003), Moyo (2000, 2006), Chivandi, Fushai & Masaka (2010), Moyo (2016), Pazvakavambwa & Hungwe (2009) and Pilossof (2016) did studies on the history of expropriation and compensation in Zimbabwe tracing it back to the colonial era. Recently, Paradza, Yacim and Zulch (2019) compared the legal provisions of the *LAA* of 1992 of Zimbabwe with the guidelines prepared by the World Bank and FAO. The study went a step further to include the expropriation and compensation guidelines of the International Federation of Surveyors (FIG). They concluded that there is a need for a review of the current statutory provisions of the *Land Acquisition Act* (Chapter 20:10) of 1992 to align them with the guidelines of the World Bank and FAO.

It is important to note that there are three distinct land tenure systems in Zimbabwe namely private land (free hold), state land, council land and communal land. Each class has different property rights, which range from freehold, leasehold and usufruct (Scoones, Marongwe, Mavedzenge, Murimbarimba, Mahenehene & Sukume, 2011). According to Paradza (2021), state land in Zimbabwe is registered in the name of the president and is classified into urban and rural state land. Beneficiaries of urban state land have lease rights with an option to purchase. With rural state land, beneficiaries have lease rights (99-year lease) with an option for renewal. In both leases, people do not have a right to sublet, but they can cede their rights

(ibid, 2021).

Communal land is like state land in that it is also registered in the name of the president on behalf of the people of Zimbabwe as stated by Section 4 of the *Communal Lands Act* of 1982 (Thondhlana, 2015). The difference is that beneficiaries of communal land have usufruct rights (Mutema, 2003; Thondhlana, 2015), unlike beneficiaries of state land who have lease rights. Also, communal land is administered by the rural district councils with the assistance of community leaders (Mutema, 2003) as provided by the Sections 5 and 9 of the *Traditional Leaders Act* (TLA) (Chapter 29:17) read together with Part 3 of the *Communal Lands Act* of 1982 (Government of Zimbabwe, 1982). In terms of Section 8 of the *Communal Lands Act* 1982 read together with Section 26 of the *Traditional Leaders Act* of 1998 and Section 4 of the *Communal Land Forest Produce Act* (Chapter 19:04) of 1987, communal land in Zimbabwe can only be used for agricultural and residential uses (Government of Zimbabwe, 1982, 1987, 1998). Council land is registered in the name of the relevant council in terms of Part 2 of the *Urban Councils Act* (Chapter 29:15)of 1997 (Government of Zimbabwe, 1997). Beneficiaries of council land usually have lease rights with an option to purchase.

Private landholders have registered freehold property rights which are registered (Section 10 of the *Deeds Registries Act* (Chapter 20:05) of 1959) (Government of Zimbabwe, 1959). It is important to note that private land (commercial farms) was expropriated from former commercial farmers during the fast-track land reform programme. The expropriated land was nationalised that is converted from private land into state land hence beneficiaries now have use rights of land that is owned by the state as discussed before. The Global Compensation Agreement (GPA) was signed specifically for compensation of such private land. The complexity of compensation for expropriation in Zimbabwe must be acknowledged. Pilossof (2016) pointed out that some of the former commercial farmers whose land was expropriated might have benefited directly or indirectly from the land which was taken from native farmers without compensation. According to Magaisa (2010), the complexity of Zimbabwe's compensation issue is compounded by the period taken without payment of compensation and various groups affected over centuries.

In view of the reviewed literature, it can be noted that currently, the process which was used to estimate the global compensation and compliance of provisions of the Global Compensation Agreement to the provisions of the existing laws is under-researched. Existing studies focused on the fairness and adequacy of compensation, the level of satisfaction of affected people as well as comparing Zimbabwean laws with international best practice. As such, this study was carried out to close this gap and contribute to the existing debate on

compensation for land compulsorily acquired for reform in Zimbabwe.

3.0. Methodology

A desktop survey was used. The main sources of data were documents and a video obtained online from websites of government institutions, the Commercial Farmers Union of Zimbabwe (CFU) and the Valcon. Parties to the Global Compensation Agreement (GCA) had joint press conferences where they were explaining to the public events leading to the agreement as well as the contents of the same. Their press conferences were recorded and are made available online. Thus, we collected data from the recorded meetings of former commercial farmers and senior government officials, the records were obtained online from the website of the YouTube account of the media houses that hosted the meetings. Additionally, we collected data from the email messages of representatives of former commercial farmers. Also, the Constitution of Zimbabwe and the Land Acquisition Act were downloaded online from the Website of the Parliament of Zimbabwe. All data were collected during the months of June 2020 and June 2021.

Content and thematic analyses were used to analysed the results of this paper with the aid of Atlas.ti8. Coding was done using the Atlas.ti8 as presented in section 4.0. The major limitation of this study was that the GCA is still a heavily guarded secret; hence, this paper was based on the little details which were made public by parties to the GCA as earlier noted.

4.0. Results and Discussion

This section is divided into 2, the first section focuses on the process leading to the signing of the GCA and the second section dwells on the contents of the GCA.

4.1 *The Legal Guiding Compensation for Expropriated for Land Reform in Zimbabwe*

Compensation for land expropriated for reform is prescribed by Section 72 of the *Constitution of Zimbabwe* (*CoZ)* of 2013 read together with Section 20 of the *Land Acquisition Act (Chapter 20:10)* (*LAA)*of 1992. Section 72 of the *CoZ*of2013reads:

> *"… no compensation is payable in respect of its acquisition except for improvements effected in it before its acquisition…"*

More detail is given in Section 295 of the *CoZ* of 2013 which elaborates on compensation for agricultural properties that were expropriated before the commencement date of the 2013

Constitution. Most of the properties that were expropriated before the commencement date of the *CoZ* of 2013 are former commercial farms that were acquired during the Fast-Track Land Reform Programme (FTLRP) of early 2000. In terms of Section 295, if the land was expropriated from an indigenous person, then compensable heads of claim include the land and improvements.

The same section also states that for farms expropriated from foreigners coming from countries with bilateral agreements, the compensable heads of claim are determined in terms of the provisions of the bilateral agreement. In terms of the same section, for all foreign nationals whose farms were not protected by bilateral agreements, the compensable heads of claim include improvements on the land and exclude the land. Section 72(7) of the *CoZ* of 2013 gave a historical background of how the land was expropriated from Africans without compensation during the colonial era and stated that the former colonial masters must pay for compensation of the land. Figure 1 is a summary of major statutory provisions guiding compensation for expropriated properties in Zimbabwe.

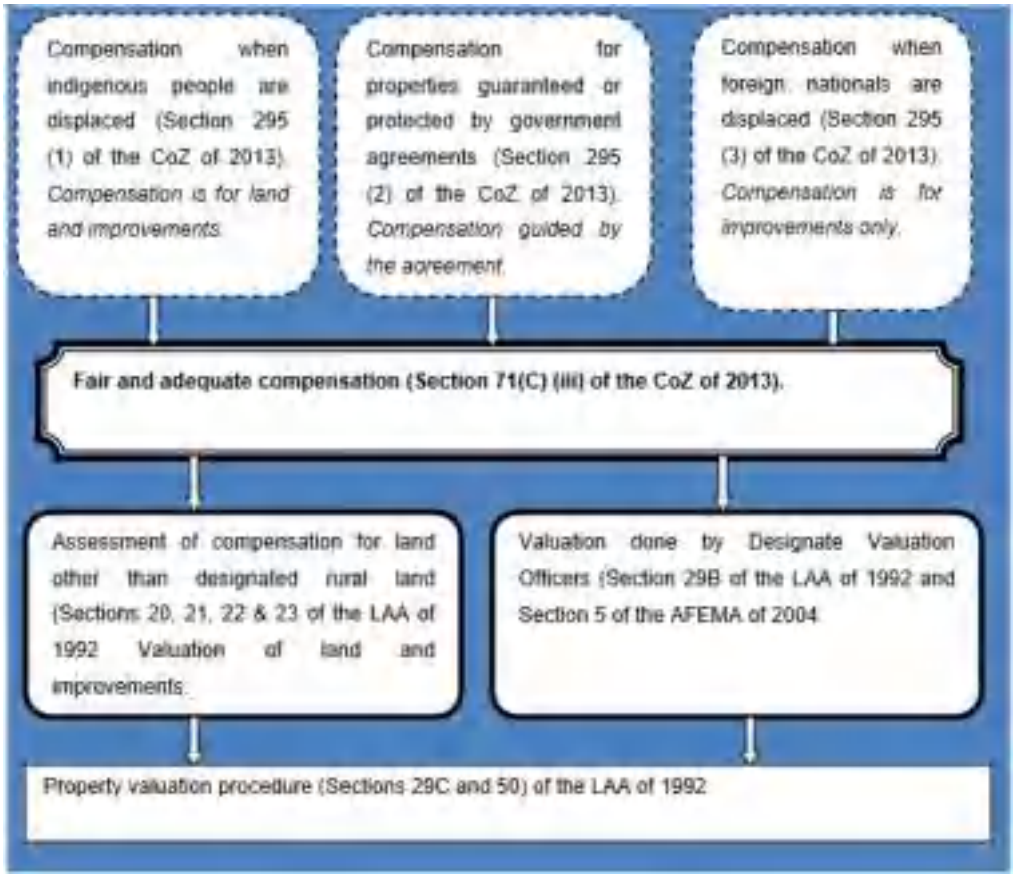


Figure 1*:* Laws Guiding Compensation for Expropriated Properties in Zimbabwe
Source: Author's formulation from Government of Zimbabwe (1992, 2004, 2013)

As shown in Figure 1, before one attempts to estimate the compensation value of an expropriated property, he/she must establish the nationality of the displaced persons. More details on property valuation for compensation of expropriated properties are laid down by the provisions of the LAA of 1992 and the Acquisition of Farm Equipment or Material Act (Chapter 18:23) (AFEMA)of 2004. The property valuation procedure for agricultural properties acquired for agricultural properties in terms of Sections 29 and 50 are shown in Table 1.

Table 1: Guidelines for valuation for improvements as provided by Sections 29 and 50 of the LAA of 1992

Type of improvement	**Guiding valuation principle**
Buildings	- The quality of their construction shall be assessed according to standards set by the Ministry responsible for housing standards for the types of building concerned. The age and condition of the buildings shall also be considered.
Grazing veld	- Compensation shall be payable for dams, dips, spray races, fencing and other improvements enhancing its value for grazing purposes. - Grazing veld shall be valued according to its carrying capacity for livestock; the highest values may be given only to fully equipped pastures with good water supplies, dips and well-fenced paddocks. - The same amounts shall be payable for improved pastures as for grazing veld of the same carrying capacity.
Irrigated land	- Compensation shall be payable for dams, boreholes, canals, irrigation equipment embedded in the ground and other improvements enhancin g its value for irrigation purposes. - Land may not be classified as irrigable for the purpose of valuation unless— - (a) it is capable of being placed under full year - round irrigation; and - (b) where it can be irrigated only in terms of rights granted under the Water Act [Chapter 20:24], such rights have, in fact, been granted.

Valuing perennial or plantation crops, such as coffee, tea, fruit, timber and sugarcane	- Regard shall be paid to the potential yield of such crops and their marketability, but only where the crops are maintained in a satisfactory condition and are well-pruned, fertilised and sprayed.
Valuing tobacco curing facilities	- Tobacco curing facilities, such as tunnels, chongololos and Dawson systems shall be valued at a rate comparable to the values given to conventional tobacco barns of equivalent output.
Valuing fencing	- (a) lower values shall be placed on fences that are not erected to standards prescribed in terms of the Fencing Act [Chapter 20:06] or with pressure - treated poles; - (b) for boundary fences, only half the values shall be paid.
Valuing electrical installations	- The costs of installing any mains electricity supply and connection points on the land shall be taken into account. - The value of the land shall be regarded as enhanced by the availability of a mains electricity supply and regard shall be paid to the number of connection points on the land.
Valuing land	- The following factors shall be considered — - (a) the soil types to be found on the land; and

Source: Government of Zimbabwe (1992)

A new dimension to the compensation matrix as provided by Section 295 of the *CoZ of 2013* was brought by the *Land Commission (Gazetted Land) (Disposal in Lieu of Compensation) Regulations (LCGLDLCR)* of 2020 that were introduced by *Statutory Instrument 62* of 2020. These regulations opened a new window for indigenous and foreign persons (protected by investment agreements prior to the expropriation) to apply and regain the title of their former properties. Of interest is Section 9 of the *LCGLDLCR* of 2020 that states:

> "*9. (1) Alienation of a piece of acquired agricultural land comprising a farm to a qualifying applicant in terms of these regulations shall be a final settlement of any claims that the applicant may have from the state in respect of compensation.*
>
> *(2) Alienation of a piece of acquired agricultural land comprising only part of a farm to a qualifying applicant in terms of these regulations shall be a final settlement of any claim for compensation to the extent that the application is successful"* (Government of Zimbabwe, 2020).

This section can be interpreted to mean that once ownership is transferred to the former commercial farmer, then there is no further compensation to be paid by the GoZ. This interpretation is motivated using the phrase "… *final settlement of any claim for compensation*..." However, one is tempted to question if this "*final settlement of compensation*" is equivalent to a fair and adequate compensation dictated by Sections 71 and 72 of the *CoZ* of 2013? Most of the affected FCFs were disturbed from their business for approximately two decades. Any compensation either in cash or land that ignore issues like disturbance and delayed compensation might not be fair and adequate. Furthermore, besides the issue of disturbance of farming business, the *LCGLDLCR* of 2020 seems to ignore the fact that most existing improvements on the farms were vandalised during and after the FTLRP and depreciated over the past 2 decades. In view of this regard, the provisions of the *LCGLDLCR* of 2020 might fall short of what is required to bring a lasting solution to the 2 decades long compensation dispute in Zimbabwe.

Section 71, subsection 3C paragraph (ii) of *CoZ* of 2013 states that the compensation must be paid before the property is acquired or within a reasonable time after the expropriation, but it does not define what constitutes a reasonable time. Section 29C (3) of the *LAA* of 1992 states that the compensation period can be fixed by the Minister of Lands and approved by the Minister of Finance as follows:

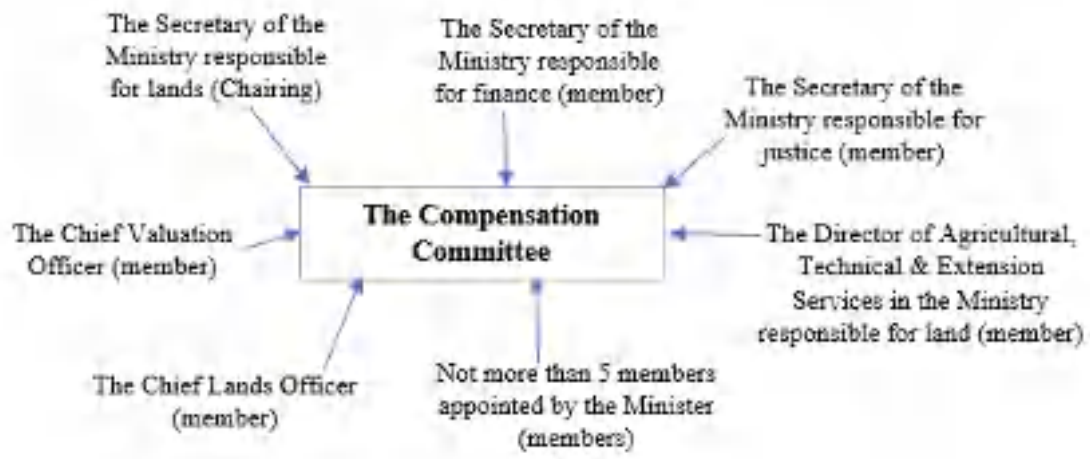
> "*Provided that—*
>
> *(a) at least one quarter of the compensation payable shall be paid at the time the land concerned is acquired, or within a reasonable time thereafter; and*
>
> *(b) a further one quarter of the compensation payable shall be paid within two years after the land concerned was acquired; and*
>
> *(c) the balance of the compensation payable shall be paid within five years after the land concerned was acquired*" (Government of Zimbabwe, 1992).

A closer look at this provision can lead to the realisation that a reasonable time stated in Section 71 of the *CoZ of 2013* if read together with Section 29C (3) of the *LAA of 1992* can be interpreted to mean any period that is not more than 5 years from the expropriation date. Also, Section 29C(4) of *LAA of 1992* provides that the minister responsible of lands decides the manner in which the compensation is paid, that is whether it is paid as a lump sum or in instalments as well as if it is paid in the form of cash or government securities. Maybe, it can be fair if the law provides the displaced people with an option to choose their preferred compensation method.

4.2 The Institutional Framework Guiding Valuation for Compensation for Expropriated Properties

The institutional framework for property valuation for expropriation is spelt out by Section 29 of the *LAA* of 1992. Determination of compensation for expropriated properties is done by the Compensation Committee (CC). The CC is an inter-ministerial committee established by Section 29 of the *LAA of 1992* to determine the values of compensation to be paid for expropriated properties. The CC base its compensation valueon preliminary property valuation done by Designated Valuation Officers (DVOs).The composition of the CC is summarised by Figure 2.

Figure 2: Institutional Framework for Property Valuation for Expropriation in Zimbabwe



Source: Adopted from (Government of Zimbabwe, 1992)

As shown in Figure 2, the CC is comprised of senior civil servants from the key ministries responsible for lands, finance, and justice as well as at most five members appointed by the minister. The fact that the CC is made up of heads of key government ministries and departments can be commendable because these are the people who make government decisions. If the CC was made up of junior employees without the power to make decisions, then the CC would be nothing more than a talk show. However, it is imperative to note that the same CC which is comprised of senior civil servants took almost 2 decades to come reach an agreement with the former commercial farmers. This can be attributed to the hostile relationship between the previous administration and the former commercial farmers which was borne out of lack of political will.

It is also important to note that the minister responsible for lands can appoint not more than 5 people to be part of the CC. However, there is no statutory guidelines on the characteristics of the people who can qualify for appointment by the minister. In this case the minister uses his/her discretion to appoint the other members of the CC and he/she is not compelled to include representatives of the affected people on his/her list of appointed persons. Therefore, there is no guarantee that affected persons will have a representative in the CC, unlike civil servants whose membership is provided for by law. One might be tempted to argue that the current institutional framework for compensation for expropriated properties is biased towards protecting the interests of the expropriating authority.

4.3 The process Leading to the GCA

The process leading to the GCA started in 2016 with the establishment of the Ad-Hoc Compensation Working Group (AHCWG) (Valcon, 2020). The AHCWGwas meant to initiate negotiations between GoZ and FCFs (Ncube, 2020; Valcon, 2020). It can be noted that the process towards to GCA was already in motion when the new administration came into power. It means the new administration which came in 2017 just proceeded with a compensation process that was initiated by the previous administration under the leadership of former president R.G. Mugabe from 1980 to 2017. Figure 3 shows the structure of the AHCWG which was adopted in 2016.

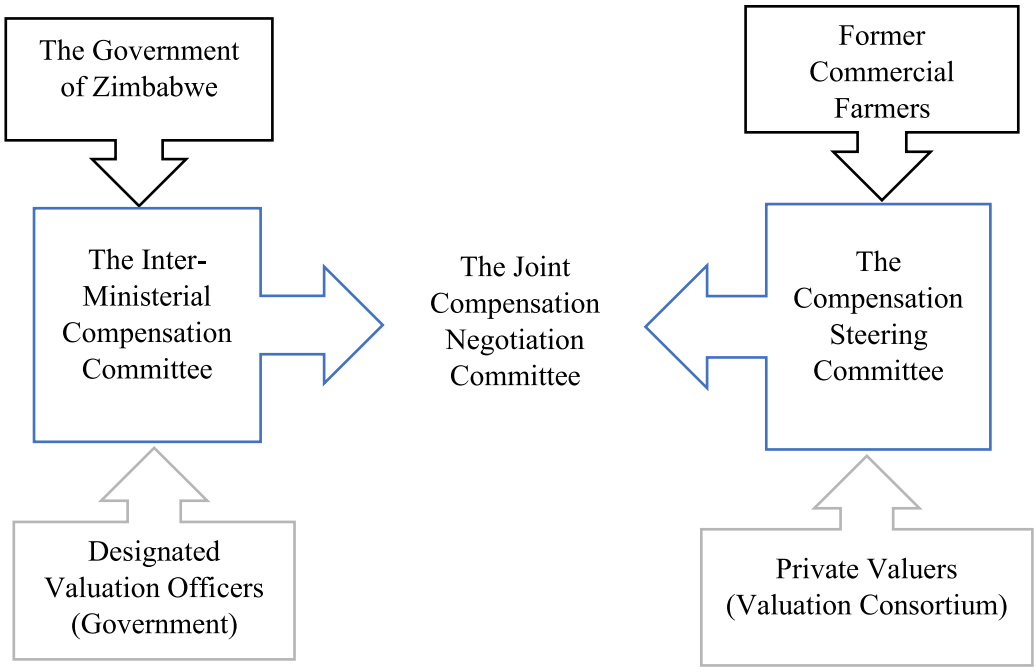
Figure 3: Institutional Framework for Property Valuation for Compensation Adopted in 2016

Source: Adopted from Valcon (2017, 2020).

As shown in Figure 3, the Ad Hoc Compensation Working Group (AHCWG) was composed of representatives of FCFs and the GoZ and it was established to negotiate technical issues of the compensation and make recommendations to GoZ and FCFs. The GoZ was represented by the CC in the AHCWG while FCFs were represented by the Compensation Steering Committee (CSC). The CSC is a creation of the Commercial Farmers Union (CFU), and its mandate was to deal with political and diplomatic issues of compensation as it represented the interest of FCFs (Valcon, 2015, 2017).

The AHCWG was later replaced by the Joint Technical Negotiation Compensation Committee (JTNC) in 2018 as shown in Figure 4.As shown in Figure 4, the difference between the JTNC

Figure 4: Institutional Framework for Property Valuation for Expropriation Adopted in 2018



Source: Adopted from Ncube (2020)

and the AHCWG is that GoZ representatives in the JTNC increased to include senior government officers from the Office of the President and Cabinet and it was now chaired by one of the government's vice presidents.

4.4 A Comparative Analysis of the Provisions of the GCA and Existing Laws

In view of the foregoing discussion, it can be noted that the composition of both the AHCWG and the JTNC deviated from the provisions of Section 29 of the *LAA* of 1992. In determining

the compensation, which was agreed in the GCA, additional members from the Office of the President and Cabinet, one of the 2 Vice Presidents, plus representatives of the FCFs were among the compensation negotiating team but are not provided for at law. Given the sensitivity and complexity of the compensation dispute, involvement of one of the national vice presidents as well as include senior government officers from the Office of the President and Cabinet was a brilliant idea which might be translated to be a sign of political will. Also, the process which leads to the GCA has seen representatives of the FCFs actively participating in the negotiations with the expropriating authority.

It was also established that when there was a compensation dispute due to wide differences in estimates done by private valuers (PVs) for the FCFs and Designated Valuation Officers (DVOs) for the GoZ, Independents Valuers (IVs) invited from the World Bank, Zambia, and Namibia to give their expert opinions (Ncube, 2020; Valcon, 2020; CSC, CFU & Valcon, 2020). The use of IVs when there is a compensation dispute is not provided for in the *LAA* of 1992, rather Section 24 of the same statute is specific that compensation disputes must be referred to the Administrative Court for settlement.

The total amount agreed for compensation in the GCA was 3.5 billion United States of America dollars which is for improvements on the land like land clearing, biological asserts, and physical infrastructure. It is imperative to note that the agreed compensation which exclude compensation for land complies to the provisions of Sections 72 and 295 of the *CoZ of 2013* read together with Section 20 of the *LAA of 1992* (CSC, CFU & Valcon, 2020; Ncube, 2020; Orphanides, 2020).

Furthermore, parties to the GCA agreed that the initial payment of 50% of the global compensation figure was to be paid within a year from the date of the agreement and the remainder to be cleared over a 4-year period (CSC, CFU & Valcon, 2020; Ncube, 2020; Orphanides, 2020). This appears to be deviation from the provisions of Section 29 of the *LAA of 1992* which states that the initial payment must be a quarter of the total compensation. In this case the government seems to have offered double of the initial compensation which it was supposed to have paid in terms of the *LAA* of 1992.However, this payment must be viewed considering the circumstances surrounding the compensation for farms expropriated for land reform in Zimbabwe. If the law was followed religiously, then the initial payment of compensation should have been paid almost two decades ago. In this view, the government is not doing any favour to the FCFs who were supposed to have received their full compensation a long time ago. The overall compensation period which was agreed in the GCA is 5 years, inclusive of thefirstyear of paying half of the total compensation amount and 4 years of

clearing the balance. This payment period is in line with the provisions of 29 of the *LAA* of 1992 as discussed before.

Parties to the GCA also agreed to establish a Joint Resources Mobilisation Committee (JRMC) which consists of representatives of FCFs and GoZ. The role of the JRMC to work with the Ministry of Finance and Economic Development is raising funds for compensation through long term debt and other financial instruments (Ncube, 2020; CSC, CFU & Valcon, 2020). The JRMC is neither a creation of the*LAA* of 1992 nor the *CoZ* of 2013. Table 2 summarises the differences noted between the GCA and the provisions of existing laws

Table 2: A comparison on the GCA and provisions of existing laws

Aspect	**Comment**
Ad Hoc Compensation Working Group (AHCWG)	Not provided for by existing laws.
Technical Negotiation Compensation Committee	Not provided for by existing laws.
Use of independents valuers (expert witness)	Not provided for by existing laws.
Exclusion of land in the compensation quantum	In line with existing statutory provisions.
Joint Resources Mobilisation Committee	Not provided for by existing laws.
Payment of compensation in instalments.	In line with existing statutory provisions.

5.0. Conclusion and Recommendations

This study concluded that there are notable aspects where GCA complied with the provisions of the *Land Acquisition Act (LAA) of 1992* and the *Constitution of Zimbabwe (CoZ) of 2013,* specially on the compensable heads of claim and the compensation period. However, an institutional framework which was used to arrive at the GCA seems to have deviated from the provisions of the same laws. One might be tempted to question why this inclusive framework adopted towards the GCA was not incorporated in the existing laws first by amending Section 29 of the *LAA* of 1992. If the GCA is a product of the existing statutes, then the procedure which conceived it should have been a product of the same laws. Where the provisions of the existing statutes were inadequate, then necessary amendments should have been done prior to the GCA.

In as much as this question can not to be ignored, the sensitivity and the complexity of Zimbabwe's compensation dispute need not to be overemphasised. Therefore, the whole process leading to the signing of the GCA can be taken as a successful laboratory experiment. As such whilst riding on its successful experience, the government of Zimbabwe needs to expedite the amendment of the *LAA* of 1992 and come up with an inclusive compensation framework.

It is important to conclude that this study was limited by unavailability of a copy of the GCA document resulting in the researchers only using the little information which was published by parties to the GCA. It is recommended that further research be done on the same area once the GCA deed is published. Additionally, since it is already two years into the signing of the agreement, there is a need to unravel the current state of affairs relative to GCA and the former commercial farmers.

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ADAPTING NETHERLANDS 'STARTERSLENING' MODEL TO IMPROVE THE CURRENT FINANCE LINKED INDIVIDUAL SUBSIDY SCHEME IN SOUTH AFRICA

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Abstract

Finance Linked Individual Subsidy Scheme Programme (FLISP) assists households who earn between R3 501 to R22 000 to get additional funds from National Housing Finance Corporation of R130 505 to the lowest income band and R30 001 to the highest income band in South Africa. This money can be used to pay for deposit or legal fees. The problem is that there has emerged a 'sandwich' class of households who earn just above the R22 000 threshold and still cannot afford entry level mortgages. Adapted from Netherlands starterslening model, the paper conceptualized a hybrid FLISP that can absorb the sandwich class termed FLISP-plus. To this class, the National Housing Finance Corporation would give 70% of the R30 001 (R21 001) while FI offer a 30% additional loan (R9 000) which can be paid after 3 years. The applicability of the proposed FLISP-plus to the South African market was evaluated by analysing responses from interview data, purposefully sampled respondents from the Department of Human Settlements (DHS) and the financial institutions. Results showed that 'education' and 'credit score' for the FLISP-plus in affordable mortgages were common themes. Further, the results showed that the proposed FLISP-plus can be adopted for the proportion of the sandwich class segment whose credit scores are low but whose incomes are high. Households can work towards improving their credit scores in order to access FLISP- plus. The study concluded that DHS can train the sandwich class to educate them on how to manage their finances well for FLISP plus to be successful in increasing homeownership. On the other hand, financial institutions can train them on different products that can support savings towards consistent mortgage payments, making

homeownership affordable.

Keywords

Assisted Affordability, FLISP, Homeownership, Low and moderate income, mortgages, South Africa, Starterslening, Netherlands

1.0. Introduction

Finance Linked Individual Subsidy Scheme Programme (FLISP) assists households who earn between R3 501 to R22 000 to get additional funds from National Housing Finance Corporation (NHFC) of R130 505 to the lowest income band and R30 001 to the highest income band in South Africa. NHFC also manages the guarantee fund allocated from the DHS since 2010. The problem is that there has emerged a 'sandwich' class of households who earn just above the R22 000 threshold and still cannot afford entry level mortgages from Financial Institutions (FIs) (Muhoro, 2015). This quagmire is also complicated by the fact that house prices are unrelenting to a first time homebuyer who has to pay for transportation, food, children's education, health among others (Olanrewaju and Wong, 2020). The question remains on how the current FLISP can be improved so that NHFC is able to extend subsidies to households who earn more than the prescribed threshold. Thus aim of this paper is to conceptualise a hybrid FLISP model that can cater for the sandwich class by adapting the “Starterslening" from Netherlands, to suit the context of South Africa. Two sub questions included:

a) Can FIs in South Africa agree with the proposed tenets of FLISP plus and the interest free loan for three years?
b) The Department of Human Settlements (DHS) agree with the tenets of FLISP-plus, extending the subsidy threshold.

To be specific, the objectives of this paper were twofold:

a) To investigate the financial institutions (FI) perspectives on FLISP – plus in South Africa.
b) To investigate the Department of Human Settlements (DHS) perspectives on the FLIP - plus in South Africa.

The paper puts forward the hypothesis that both the financial institutions (FI) and the Department of Human Settlements (DHS) positively appraise FLISP – plus by extending

housing finance to the sandwich class who constitutes first time homeowners.

2.0. Literature Review

Low-income households generally do have access to mortgages and they face stricter lending standards which restricts them as such loans are long term (Nwuba and Chukwuma-Nwuba (2018; Baqutaya, Amoako and Boamah, 2017). As defined, affordability is the ratio of the sum of total loans to the income or total household salary. This means that most households end up renting instead of constructing or buying a finished house from the market and the challenges associated with renting are well known in literature (Asante, Gavu, Quansah, & Osei, 2018; Bah *et al*. 2018). FIs focus on extending mortgages to creditworthy households who are less risky (Afrane and Asamoah, 2011). Most low and moderate income (LMI) households are not able to pay the needed deposit due to a maximum debt-to-income ratio (affordability ratio) and poor credit score ratings (Limba, 2019); Acolin, Bricker). Another problem is that FIs do not lend to those households who are informally employed because proof of income is difficult to ascertain.

Ganiyu, Fapohunda and Haldenwang (2017) state that the households in South Africa do not have the capability to access mortgage finance properly. Expansion of credit programmes will have valuable positive effects on LMI households who live in abject deprivation in the form of informal settlements where slums are known to have an environmental and health risk to society (Sobantu, Zulu and Maphosa, 2019; Nyashanu et al. 2020). LMIs were unable to acquire formal resources due to lengthy and difficult procedures.

There is a role that government can play in collaborating with FIs to make low income mortgages more accessible and affordable, especially in lowering interest rates for low income households (Kavishe & Chileshe, 2019; Jayantha and Oladinrin, 2020; Muganga and Gitahi, 2021). This is because access to low income mortgages is constrained by high interest rates in most countries resulting in a small percentage of the urban population affording a mortgage (Mohd-Yusof et al. 2019; Nwuba et al. *ibid*; Kieti and K'Akumu, 2018). Even for those who can afford initial mortgages, there are higher chances of defaulting as mortgage payments on adjustable-rate mortgages rise (Campbell and Cocco (2015).

The Current Finance-Linked Individual Subsidy Programme (FLISP) in South Africa

In 2006, DHS in South Africa introduced FLISP and the National Housing Finance Corporation (NHFC) was mandated to manage the programme to assist the 'gap market' households with the purchase of a mortgaged house (new or resale), a serviced site, or the construction of it

thereof. Houses can be detached, semi-detached single or double-story building with a floor area of more than 40 m2 (Ludick, Dyason and Fourie, 2021). Broadly, FLISP was intended for households whose income is inadequate to qualify for a home loan, but which exceeds the maximum limit applicable to access government's 'free basic house subsidy scheme', known as the Reconstruction and Development Programme (RDP) housing (Maluleke, 2019). Household income threshold started off between R3 3001 to R15 000 and currently is between R3 5001 to R22 000 (Butcher, 2020; Coetzee, 2018; Cirolia (2016). The FLISP subsidy is a once off amount that is paid into the mortgage provider to reduce the mortgage amount so that the mortgage payment is lesser. It is a deposit payment that helps first-time home buyers to purchase a house.

Each housing programme has its own set of eligibility requirements. Maluleke, Dlamini and Rakololo, *(ibid)* describe that a person is eligible for a subsidy if he or she is a lawful resident of South Africa or in possession of permanent residency status; legally competent to contract; and has not previously received government assistance. Additionally, persons who previously had a fixed residential property may be eligible to purchase a vacant serviced site if the property was bought without government assistance. The Chief Directorate Policy Development, 2010 shows that the Housing Subsidy System (HSS) administers the National Housing Programs, and all beneficiaries of housing subsidies are documented on the National Housing Subsidy Database to guarantee that no one receives assistance twice. For South Africa, the problem is that there has emerged a 'sandwich' class of households who earn just above the R22 000 threshold and still cannot afford entry level mortgages. The paper identifies the need to adapt from other countries how to open mortgages to LMI households, the likes of Nettherlands.

'Starterslening' assists LMI mortgages for first time homebuyers in Netherlands

Netherlands introduced 'starterslening' to bridge the gap of the gap market (missing middle, the sandwich class). The programme is targeted at first time buyers and it provides a special purpose fund called the SVn (public housing stimulation fund) as an extra loan. SVn is financed by contributions from participating municipalities' housing associations and the central government (Elsinga, Hoekstra & Dol, 2015; Hoekstra & Marais, 2016). This decreases the beneficiary's mortgage loan, making homeownership accessible (Fasakin, Olanrewaju, and Umeokeke, 2019; Deng, Yan, and Chen, 2019). The loan is intended to be taken out on top of a regular loan. The borrower does not have to pay any interest over this added loan for the first three years. Additionally, the borrower will be tested every three years and if the borrower's income conditions improve, then the loan is repaid over 30 years. After three

years of paying the interest on the regular loan (the interest is determined by National Mortgage Guarantee (NHG)), then the applicant will start to repay the additional loan amount. On the other hand, if the borrower's conditions are still below the expected income growth, then the borrower can continue to keep paying interest with no loan repayment on regular loan (Jones & Semlali, 2018).

Hoekstra & Marais (2016) compared Western European housing finance products for the gap market and considered their potential applicability in South African market. In their paper, they argued that the Western European housing financing products for the gap market could potentially work in South Africa even though there are obstacles ranging from macro-economic differences to institutional problems at local levels. There is a gap in research on how the current model called FLISP in South Africa can be extended to a slightly higher income group. This paper proposed a modification of the current FLISP subsidy in the South African market by proposing a FLISP –plus model by adopting some elements of the 'Starterslening' programme used in the Netherlands.

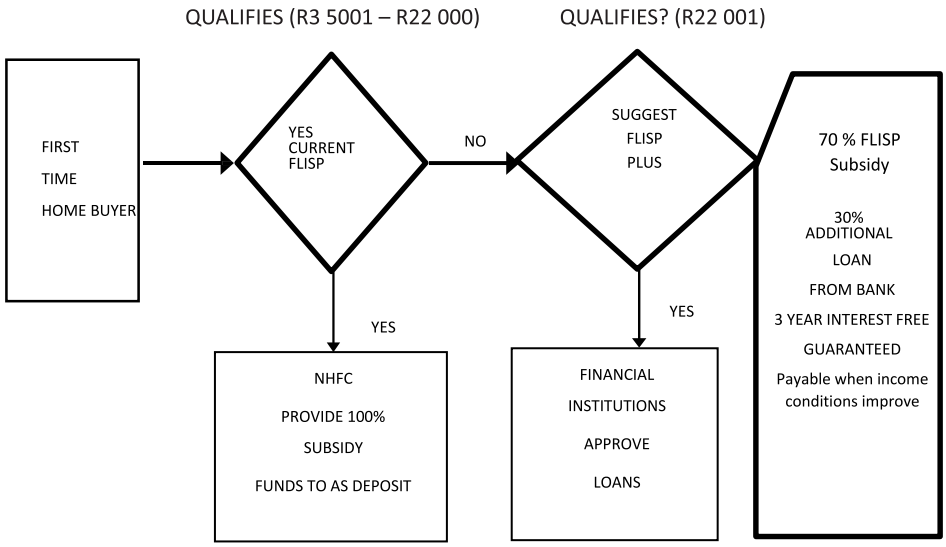
3.0. Theoretical Underpinnings; Mortgage Risk & Access To Homeownership

Investment theory postulates that a good investment asset does not lose its value in the future. FIs are encouraged to finance LMI mortgages which do not pose the risk of default. Thus, the NHFC guarantee provided by the DHS and the Association of Mortgage Lenders (AML) has an effect to reduce mortgage default. In South Africa, there is fear of the default 'culture' that was linked to political objections against apartheid where people would simply stop paying because they attained democracy and they earn depressed incomes (Mutsindikwa, 2020; Okem, Myeni, Mtapuri, and Nkambule, 2019; Rakodi and Withers, 1995). The guarantee is highly considered in the LMI market as it encourages private sector participation. From this theoretical view point, the paper adapted from Netherlands starterslening model, a conceptualized hybrid FLISP that has potential to absorb the sandwich class termed FLISP-plus. FLISP-plus is considered low risk, as the mortgage is guaranteed by DHS and so it will be a success in making LMI households access a mortgage in South Africa. This will also promote inclusive housing developments which have potential to subsidize the lowest income home owners (Simbanegavi, 2019; Deng, Yan, and Chen, 2019)

4.0. The Conceptualized Flisp- Plus

Adapted from the Netherlands starterslening model, the paper conceptualized a hybrid FLISP that can absorb the sandwich class termed FLISP-plus. To this class, the NHFC would give 70% of the R30 001 (R21 001) while the FI offers a 30% additional loan (R9 000) which is interest free for three years. If the financial situation of the home buyer improves after three years, then the bank will start charging interest on the additional loan. If the financial situation does not improve after three years, then the financial condition of the home buyer will be tested every year until a household is able to start paying for it over 30 years, illustrated in Figure 1.

Figure 1: The conceptualized FLISP- Plus



Source: Authors

5.0. Research Methodology

The paper uses qualitative research under interpretivist paradigm to get a deeper investigation into mortgage affordability concepts that are quantitative in nature. Following Nichiforeanu (2020), the paper used purposeful sampling targeting people who work in home loan departments such as managers of different FIs as well as policy makers and project managers at the DHS in South Africa. Employees from the financial institutions and the department of human settlements were scheduled for interviews at their convenient times. Fourteen FI experts and twelve DHS experts prompted a research saturation that was satisfactory to the researchers. Responses were recorded, cleaned, and converted into text documents.

Primary data was collected using individual structured interviews and final nodes captured the answers given under each specific question and facilitated colour coding as a thematic analysis in an iterative way. Following Adams *et al.* (2016), there was no need for a larger number of participants except to establish a saturation point. The interview data was collected in an exhaustive way whereby interviews took between 20 minutes to one hour. The schedule of questions for the FIs consisted of 15 questions that focused on the additional loan interest and the term of the loan. Validation of the nodes was done through a second stage of data collection. The researcher facilitated the process by engaging participants who are experts to synthesize and rationalize the different views that emerged from interview data. Cross validation involved contacting participants again to check the exactitude of facts and observations. NVivo 1.5.1 software was used to analyse the documents.

6.0. Results

Financial Institutions' perspective on FLISP plus

A thematic analysis was used to derive all the themes that are shown in Table 1 using responses from financial institutions. Some of the names in the themes were cut, this is due to the output we obtained from the Nvivo tool which was used to derive the themes.

Table 1: FIs Responses Themes

Source: Authors

The size of each box denotes the importance of each theme. The bigger the size of the box, the more important is the theme. Through text analysis, respondents focused on credit scores, credit behaviour, educational and zero fees initiatives, income, savings management, and fees costs where the size of each box denotes the importance of each theme. Education theme alludes to how home buyers should be able to manage their finances in order to have a healthy credit score which will allow them to have access to credit. From the distribution of each theme from all twelve respondents from the FIs, 'credit access' and 'mortgage costs' were common themes shown in Figure 2. Word cloud in Figure 2 for FIs showed 'banks', 'interest' and 'credit'.

Figure 2: FIs Word Cloud

Source: Authors

Figure 3 shows the association between themes which were frequently mentioned. The text tree considers text that appears before and after the theme of choice. Words 'credit' goes together with 'scores' showing how households' credit scores affect one's access to the additional loan prescribed in FLISP-plus.

Figure 3: FIs Text Search

Source: Authors

Department of Human Settlements perspectives on FLISP plus

A similar thematic analysis was performed to extract the themes for the DHS. Through text analysis, important themes were education, policy, lending, credit scoring and incentivize. Again 'education' theme alludes to the fact that DHS prefers that FLISP –plus home buyers understand the product that they are taking with the FIs. The distribution of themes also showed that education was suggested and over and above that, all respondents mentioned credit record and policy in their responses. A word cloud for the DHS showed that 'government' and 'affordability' were the most mentioned words.

Sentiment analysis for FI and the DHS

To both the FIs and the DHS, a question was posed for the sentiment analysis:

> *'FLISP-plus is considered low risk, as the mortgage is guaranteed by DHS, will it be a success for the LMI households in South Africa?'*

Sentiment analysis was done to see if the respondents were positive, negative, neutral or mixed in their point of view on the application of the adapted low income mortgage model in South Africa. Some respondents were negative about the adoption of the FLISP-plus. Overall, the sentiment analysis showed that most respondents were positive that the new model will be successful if implemented by the NHFC.

In all the analyses that was performed using both DHSs and FIs responses, we observed that there is commonality in their point of view. The commonality stems from the fact that

applicants would need to be educated in one form or the other and the education must include teachings about the FIs products and also financial literacy. The education will improve the credit scoring standings of the applicants, which will then lead to easy access to bank's credit products when LMI applicants decide to be homeowners. This will accelerate homeownership in South Africa if initiatives such as the FLISP - plus are adopted.

7.0. Discussion

This paper investigated an extended version of the current FLISP as highlighted by Coetzee (2018), who suggested adjustments to it. Further, this paper shares the same sentiments with Coetzee (2018) on the issue of the gap market as a model to expedite homeownership in South Africa. The view of the FIs and those of the DHSs on the application of FLISP - plus corroborates with what is discussed by Hoekstra & Marais (2016). Government has a role to play and continues extending subsidies to the LMI households (Jarbandhan, Viljoen, De Beer, and Blaauw, 2016). They suggested adoption of financing products in South Africa from the Western European countries. A 'savings' culture cannot be underestimated (Chen, and Deng 2014) and this talks to the financial literacy that was discussed in our paper. The LMI applicants who are knowledgeable about the bank's products and who are financially savvy will only show the efficacy of the FLISP-plus.

8.0. Conclusion and Recommendation

The respondents from FIs highlighted the need for LMI households to have a good credit score as well as educating the applicants and the FLISP-plus beneficiaries about financial management. With financial management, it is possible to have a good credit score. Results showed 'credit' and 'scores' words being inseparable and this shows how the success and ability of FLISP –plus hinges on good credit scores which come from good financial management. The knowledge of the products from the FIs has potential to assist LMI households to make better choices when applying for mortgage products on offer from government and private sector collaboration.

The perspective from the DHSs on the application of the FLISP-plus is that there should be avoidance on extending the new programme to applicants that have adverse credit scores.

The negative responses pertaining to application of the 'FLISP - plus in South Africa from the sentiment analysis purely came from the fact that some first-time home buyers who fall in the

sandwich class, usually have low credit scores and low affordability. It will be difficult to apply the FLISP plus to those individuals. If the affordability ratio is high, it means a household may be at risk of mortgage default. It can be concluded that the 'FLISP plus can be applied only to applicants that have low credit scores but high affordability in the sandwich class. This means that FLISP –plus will be successful if a household has a lower sum of owed loans relative to the household income. The paper recommends that if individuals have low credit scores and have good affordability, then FLISP plus can be applied. Recommendations to industry and include:

Contribution to industry

- The paper has put forward a model for adoption by NHFC to extend the LMI household access home mortgages through the new FLISP—plus.
- FIs can identify pockets of households that can qualify to apply for FLISP - plus. This will provide a new stream of revenue for financial institutions as it is a new business.

Limitations and future research

The limitation of the research was reinforced by the Popi Act of 2022 which prevented the identity of households that could be evaluated for FLISP – plus. Investigation could not get insight from the targeted households. Further, the cut-off threshold for 'high affordability' needs to be quantified in the future research.

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THE ENVIRONMENTAL IMPLICATIONS OF INFORMAL SETTLEMENTS ON THE DENIZENS OF MSHOLOZI, SOUTH AFRICA

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Abstract

The severity and extent of the challenges bedevilling the informal settlements are dissimilar because of the different geographical and contextual settings. Thus, using a common solution to the menace might not work in all contexts, without first, understudying the peculiar challenges of informal settlements within an area. Additionally, since the cause(s) of informal settlements varied considerably within a country and across countries, understanding the triggers relative to specific locations is necessary; to know what went wrong and how this could be remediated. Therefore, this study aims to, not only, evaluate the environmental challenges, but evaluate the triggers of the Msholozi informal settlement in South Africa. Accordingly, data for the study was collected from the residents, municipal officials, Departments of Human Settlements and Public Works officials. Whilst the results of this study have some commonalities with previous works, including, (1) an insalubrious living environment (2) overstretch of existing poor facilities (3) water and air pollution, and (4) block drainages and erosions among others; the triggers are fundamental. Findings imply that both the government and the dwellers are complicit in the development and challenges being faced thereof, in Msholozi. Thus, it is recommended that urgent and honest steps should be taken by concerned parties, toward remediating the menace. The steps should among others include (1) assemblage of stakeholders for a meeting to understand the genesis of the problem; (2) educating all parties on the consequences of their actions to the environment and the inhabitants; (3) promoting agreement among the stakeholders on their roles and responsibilities towards tackling the challenges; (4) taken the census of the residents to aid the government in decision making.

Keywords: Environment, Informal settlements, Msholozi, Pollution, Remediation

1.0. Introduction

How human beings use the environment is directly proportional to what they receive from the environment. Most health-related challenges being faced by several humans are the results of improper human activities in the environment. A well-informed society where residents are aware of uses that detrimentally affect the environment avoids such improper practices. Similarly, there are areas/neighbourhoods where detrimental practices are not avoided because of a lack of such knowledge. Again, there are places where the residents are aware of the implications of negative human activities on the environment but helplessly indulge in such practices because of poverty or lack of economic will to avoid them.

Challenges that bedevilled the environment as a result of human practices could be minimal or major. By minimal challenges we mean those usages that include informal settlements that triggered household waste generation and indiscriminate disposal, overcrowding, and non-adherence to safety standards and building codes, among others. Major environmental challenges are those usages that include deforestation, mining and related activities, industrial wastes, and air and water pollution. While environmental challenges are not confined to a particular location, some have since been remediated in several countries. For instance, although the "minimal" environmental challenges have since been remediated in most developed countries; there are still issues of industrial waste and vehicular fumes.

The concern of this paper, however, is the "minimal" environmental challenges relative to the informal settlements, of which part of the consequences was aforementioned. Informal settlements are a creation of the poor implementation or absence of governmental policies on housing for the citizens. In the Republic of South Africa with its unsavoury history of apartheid, the proliferation of informal settlements has reached a worrisome level (Napier, 2017; Msimang, 2017). This is happening because of the dereliction or neglect of authorities to the provisions of section 26 (1) of the country's constitution, which provides, that every citizen has the right to access adequate housing.

Despite the constitutional provisions, several disadvantaged citizens are forced to settle in informal areas across the nine (9) provinces (Housing development Agency, 2016). According to Mutero & Makwara (2018), the poor handling attitude leading to delays by the Department of Human Settlements in allocating houses to the people within the low-income bracket aggravated the problem. The consequence of such neglect is the

proliferation of several informal settlements around South Africa. Additionally, the Socio-Economic Rights Institute of South Africa (SERI) (2018) stipulates that poor planning, lack of coordination, insufficient capacity, failure to monitor the correct implementation of government policies and lack of political will have plagued the implementation of the right to adequate housing.

Previous studies regarding this subject exists (Ali & Sulaiman, 2006; Tsenkova, 2010; Olajide, 2010; Tilaki, Mustafa, Marzbali, Abdullah & Ariffin, 2011; Onyekachi, 2014; Jones, 2017; Mutero & Makwara, 2018). Ziervoge, Waddell, Smit & Taylor (2016); Msimang (2017); Muanda, Goldin and Haldenwang (2020) and Nixon (2020) are the known studies on informal settlements in South Africa that relates to the environment. The focus of this study is unique in that location is different and additional participants, including governmental officials, were introduced that previous regional studies have not addressed. The main motivation is to see if the findings of previous regional (South African) studies could be replicated, so that generalised conclusions and appropriate policy statements would be made to ameliorate the problems of the informal settlement in South Africa.

Accordingly, the study is divided into six sections, including section one which introduces the study. Section 2 review the literature. Section 3 indicates the research methods that were used in the study. Section 4 shows the results and discussion of the study. Section 6 recommends and concludes the study.

2.0. Literature Review

Several studies have been done about the environmental challenges that affect the people living within informal settlements. Thus, illegal housing development and ownership, overcrowding of people in houses, and indiscriminate waste generation and management are some of the challenges that are prevalent in informal settlements. Accordingly, Thomas (2001) was of the view that any harm by people to the environment which result in a change in the physical environment state and which society no longer find useful is an environmental challenge. The author believes that most establishments of informal settlements have a very negative impact on the physical environment, and therefore no doubt that informal settlements are an environmental challenge.

2.1 The environmental challenges affecting people in informal settlements

Sands and Peel (2012) believe the environment to be anything natural in terms of its

features and products. United Nations (2009) believes that the unplanned use of land, which contributes to deficient infrastructure and urban sprawl, is associated with the environmental challenges experienced in informal settlements. According to Nasar & Elsayed (2017), natural and manmade hazards threaten informal settlements since they can't stand disaster. Opiyo, Osano, Mbandi, Apondo & Muhoza (2020) indicated that the inhabitants of illegal settlements frequently erect their structures in low-lying areas closer to riverbanks and might experience flooding and other disasters.

Informal settlements appeared to be a lingering crisis in several countries. As observed by Todaro (2014) and Srivanas (2015), informal settlements are a solution to the growing housing needs of an increasing population in cities and villages. This is because the informal dwellers would have been homeless without shacks and indecent roofs over their heads. However, the negative environmental and other negative consequences that follow informal settlement impede its existence. South Africa's informal settlements face a large number of environmental challenges. These challenges range from flooding, air pollution, waste disposal and soil degradation.

2.1.1 Pollution

a. Air pollution

Formal and informal settlements do suffer from both outdoor and indoor air pollution. However, informal settlements are, hit the most by air pollution. Nassar & Elsayed (2017) indicated that informal settlements have two different types of air pollution. These are stationary and mobile sources. A stationary source includes industrial facilities, thermal power stations, and commercial and residential activities. A mobile source includes passenger cars, buses, trucks and motorcycles.

According to West, Buker, Ashmore, Njoroge, Welden, Muhoza, Osano, Makau & Apondo (2019), informal settlement dwellers are exposed to a different mix of pollutants because most of the settlements are usually constructed closer to industrial plants, dumpsites and dirt tracks. Another factor is the intensive use of biomass fuel within the settlements. They further explained that informal settlements dwellers also experience a high level of air pollution due to the building materials they use to build their homes

b. Water pollution

Water is a fundamental substance that is required for survival by humans, animals, and plants. Napier (2017) reports that water pollution in informal settlements is caused by wastewater from domestic use activities, solid waste disposal, which is improper, and faecal contamination caused by the residents of the informal settlements. According to

Hennigan (1969), when any inflow into the water cycle affects the quality of water to the degree that a genuine use is affected, such is referred to as water pollution. Devi, Lowly and Weber (2017) in Suva, Fiji found that informal settlements impair the availability of clean water because of indiscriminate waste disposal.

2.1.2 Solid waste management

According to the National Environmental Waste Act 59 of 2008, waste is defined as any unwanted material or substances that are no longer required and ready to be disposed of or discarded by the user or holder. Mbonambi (2016) reiterated that the lack of a proper waste management system is another basic issue faced by inhabitants of slums. According to Ferguson (1996) and Msimang (2017), in Montego Bay, Jamaica and Pietermaritzburg, South Africa found that the informal settlements experience a backlog in waste collection due to limited roads and infrastructure. The studies further stated that the waste collection vehicles cannot reach some households due to the bad road infrastructure, lack of cooperation among residents and shortage of finance.

Unfortunately, the backlogs in collecting the waste from settlements had in the past been responsible for the spread of diseases (Ali and Suleiman, 2006; Napier, 2017).

2.1.3 Natural hazards

According to Delgado (2019), any natural process resulting in injury or death, damaging property, and negatively impacting health, social, economic and environment is believed to be a natural hazard. According to Parikh, Bisaga, Loggia, Georgiadou & Ojo-Aromokudu (2020), informal settlement dwellers are exposed to flooding risks during periodically heavy rains due to some of the houses that are built close to streams. Mbonambi (2016) concur with this statement and indicated that the improper layout plan and construction of informal settlements have overfilled many natural waterways and have resulted in recurrent floods during rainy seasons.

From the foregoing reviewed studies, the case for Msholozi, Mbombela, South Africa begged for attention since there are no known studies relative to the environmental implication of informal settlement in the location. Moreover, the importance of context comes to bear in this analysis because of the first-hand information it provides on the study area.

3.0. Research Methods

This study was conducted in the Msholozi informal settlement, which is under the

jurisdiction of the City of Mbombela, Mpumalanga Province, South Africa. The houses in Msholozi are built on land that belongs to the Department of Public Works. Thus, the residents in the study area, officials of the city of Mbombela and the staff members of the Department of Public Works and the Department of Human Settlements, whose administrative duties extend to the study location, formed part of the research participants.

This research used a survey design to gather relevant information. According to the household survey that was conducted by the City of Mbombela in 2019, Msholozi informal settlement is home to about 7354 households. A formula advanced by Kothari (2004), was used to determine the sample size from the sample frame of 7354 households, the reason is that the sample frame of 7354 is too large for meaningful data collection. A sample size of 192 was arrived at, which was systematically administered to the household head of each house visited. However, out of the 192 administered questionnaires; only 136 were returned, representing a 70 per cent return rate. Thus, the 136 returned questionnaires were used for the study.

Two officials, one each from the Departments of Human Settlements and Public Works were purposively chosen for data collection. These were chosen because of their direct involvement with the people and knowledge of governmental policies and implementations in Msholozi, Another two officials from the city of Mbombela including, (1) the Ward Councillor and (2) the city of Mbombela Human Settlement officer, were also selected for data collection. Additional details about these officials are found in the analyses.

4.0. Analyses and Discussion

As noted earlier, informal settlements have grievous consequences on the residents even though failure in governance might have triggered their development. The analyses revealed some of the environmental implications of informal settlements in Msholozi, Mbombela. Planning suggests that if an area or house is designed to accommodate a certain number of persons, any breach relative to an increase in the required number would not only lead to overstretching of facilities but an unhealthy living environment. This is the case of the Msholozi settlement, whereby, houses are built indiscriminately without recourse to the law. Accordingly, analysis in Table 1 reveals the physical characteristics of houses and adherence to building regulations in the study location.

Table 1: Physical characteristics and adherence to building regulations in Msholozi

Characteristics	Unsure	Respondents and Percentage (%) Totally Disagree……Totally Agree					MS	Rank
		1	2	3	4	5		
No building plans	32(23.5)	07(5.1)	18(13.2)	11(8.1)	14(10.3)	54(39.7)	3.86	1.0
Incorrect zoning	24(17.6)	11(12.5)	17(12.5)	20(14.7)	13(9.6)	51(37.5)	3.68	3.0
Scheme violations	36(26.5)	09(6.6)	14(10.3)	20(14.7)	12(8.8)	45(33.1)	3.70	2.0
Poor building material and house qualities	20(14.7)	27(19.9)	12(8.8)	25(18.4)	14(10.3)	39(27.9)	3.21	4.0

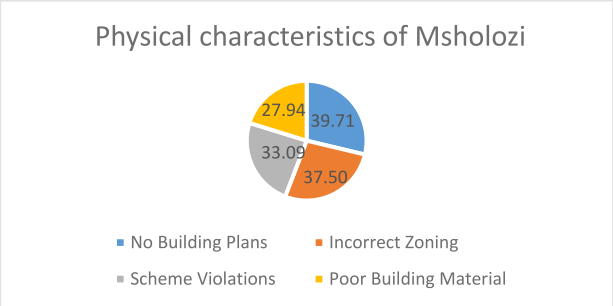

Figure 1 Physical characteristics of houses in Msholozi

The study location is characterised by several defective building rights and regulations as the analysis in Table 1 and Figure 1, respectively, suggests. The results show that houses in the study area were built without recourse to building plans as shown in the mean score of 3.86. Total violation of the land use scheme in the study area ranked second with a mean score rating of 3.70. Furthermore, improper zoning is another challenge prevalent in the informal settlement of Msholozi, ranking third in the order of severity as suggested by the respondents. This has a mean score rating of 3.68, which shows that people do not follow the zoning requirements provided for by the city of Mbombela. Fourthly, analysis shows that houses are built in Msholozi with sub-standard building materials. This has a mean score of 3.21, reflecting the economic strength and the land of proper tenurial rights of the people to build in the study area. It must be noted that the city of Mbombela housed all governmental agencies that are responsible for overseeing the day-to-day administration, development and management of people and the environment in Msholozi.

The insalubrious nature of the environment is caused by the act of outright violation or neglect of the building codes and standards. The infiltration of people into the area because of improper planning and documentation of the people to establish the genuineness of their occupancy is the major concern of the Department of Human Settlement in Mbombela. Thus, since the residents at Msholozi informal settlements illegally occupied the land, there was no

way the local authority would approve the building plans without proof of ownership of the land, which all the residents do not possess.

The analysis also reveals the different ownership statuses of residents in the study area as shown in Table 2.

Table 2: Ownership status of residents in Msholozi

Status	Frequency	Percentage	Cumulative %
Owner Occupied	36	26,5	26.50
Renter/Tenant	25	18,4	44.90
Family House	71	52,2	97.10
Others	04	2,9	2.90
Total	**136**	**100**	**100**

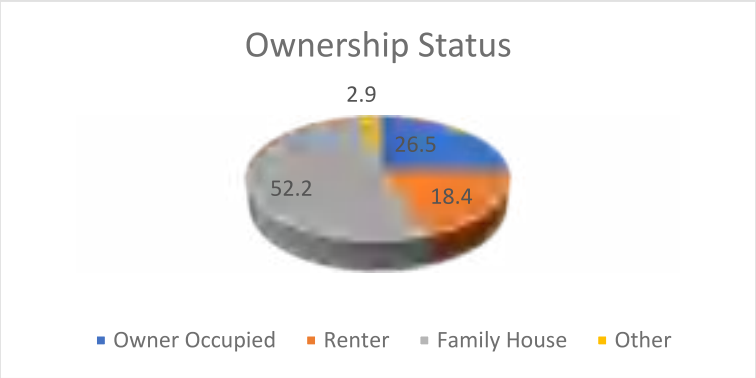

Figure 2 Ownership statuses of residents in Msholozi

Table 2 and Figure 2 were used to depict the owner states that the respondents have in Msholozi informal settlements. At least 52.2% of the respondents indicated that they are living in a family house. About 26.5% of the respondents indicated that they are owners of the properties, with 18.4 % of the respondents indicating that they are tenants. About 2.9% of the respondents indicated others as their reason for living at Msholozi. Others imply they are squatters in the study area.

The analysis also reveals that pollution is another environmental consequence of the Msholozi informal settlement relative to air pollution. Accordingly, Table 3 summarises the results of the causes of pollution in the study area. Table 3 and Figure 3 show an increase in air pollution triggered by fuel woods, unserviceable vehicles, indiscriminate bush burning and other solid fuels. These are consequences of population growth as more and more people

found solace in living in such areas where they pay a little amount or nothing for accommodation. In specific terms, the results show that respondents, with a mean scoring rate of 4.17, indicated that the fuel woods used by residents for cooking or house heating contributes to the environmental challenge of air pollution. Also, a mean scoring rate of 3.40 indicated that solid fuels also contribute to the environmental challenge of air pollution in Msholozi. This is closely followed by indiscriminate bush burning within the area by the residents with a mean score of 2.95. Lastly, the analysis shows that respondents, with a mean scoring rate of 2.87, believed mobile sources including passenger cars contribute to the environmental challenge of air pollution at Msholozi. This is because many of these cars are not in good shape; hence, the rate at which they emit toxic fumes is high.

Table 3: Problem of air pollution on the residents of Msholozi

Causes of pollution	Unsure	Respondents and Percentage (%) Totally Disagree……Totally Agree					MS	Rank
		1	2	3	4	5		
Smoke from indiscriminate burning	27(19.9)	33(24.3)	42(11.0)	15(10.3)	14(10.3)	32(23.5)	2.95	3.0
Fuelwood	14(10.3)	07(5.1)	09(6.6)	11(8.1)	24(17.6).	71(52.2)	4.17	1.0
Solid fuels	20(14.7)	17(12.5)	20(14.7)	23(16.9)	12(8.8)	44(32.4)	3.40	2.0
Unserviceable vehicles	36(26.5)	20(14.7)	28(20.6)	18(13.2)	13(9.6)	21(15.4)	2.87	4.0

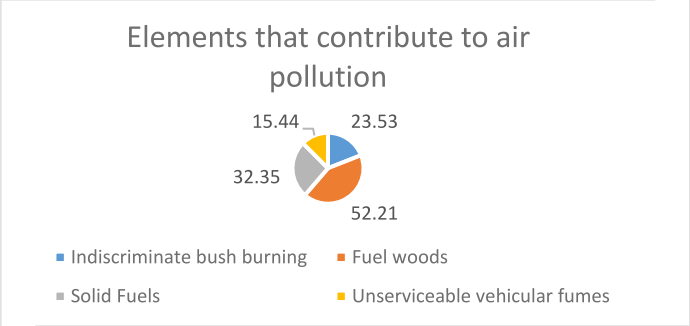

Figure 3: Elements that contribute to air pollution among the residents of Msholozi

Kings (2019) indicated that South Africa records about 20 000 deaths caused by air pollution in a year, and the estimate was according to the World Health Organisation (WHO). He further elaborated that the causes of death are burning wood and coal used for cooking and heating in people's homes, heavy industry polluted air and vehicle exhaust fumes. Again, as a consequence of informal settlements, authorities do not carry out effective supervision to ensure that waste generation and disposal are properly done. Since the people knew they are illegal settlers they most probably indulge in acts detrimental to their health unknowingly or helplessly. The analysis in Table 4, Figure 4 and Plate 1 captures the extent to which residents handled their waste disposal.

The results show that the lack of infrastructure and a possible location for waste disposal management at Msholozi, ranked prominent with a mean score of 3.96. On the subject of a possible designated location for waste disposal, the authorities noted that only minimal responses are made due to the illegality of the dwellers. Additionally, an analysis of respondents (residents') opinions suggests that there is no waste collection from the City of Mbombela. Approximately 39.7% of the respondents with a mean scoring rate of 3.45 are of the view that waste dumped in the back of the house contributes to the waste disposal management challenge at Msholozi. A mean scoring rate of 3.35 indicated that the backlog in the collection of waste contributes to the waste disposal management challenges in the study area. The result is supported by the pictures in Plate 1, whereby residents dispose of their waste everywhere since they do not have a proper location for dumping their waste.

Table 4: Waste Collection and Management in Msholozi

Waste Disposal	Unsure	Respondents and Percentage (%) Totally Disagree……Totally Agree 1	2	3	4	5	MS	Rank
No waste collection	07(5.1)	42(30.9)	09(6.6)	07(5.1)	08(5.9)	63(46.3)	3.31	4.0
Waste backlog	17(12.5)	25(18.4)	15(11.0)	20(14.7)	11(8.1)	48(35.3)	3.35	3.0
Waste dumped indiscriminately	13(9.6)	28(20.6)	13(9.6)	16(8.8)	16(11.8)	54(39.7)	3.45	2.0
No authorised waste disposal site	14(10.3)	14(10.3)	10(7.4)	15(11.0)	11(8.1)	72(52.9)	3.96	1.0

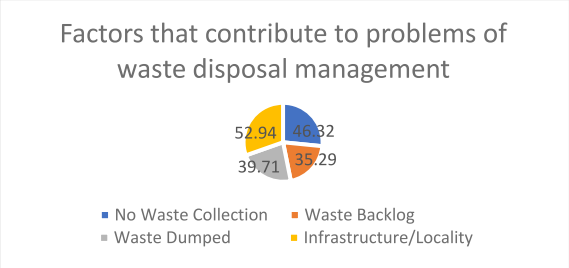

Figure 4: Waste disposal management challenges in Msholozi.

Plate 1: Indiscriminate and unauthorised waste disposal management in Msholozi

Table 5: Causes of overcrowding of residents in Msholozi

Overcrowding	Unsure	Respondents and Percentage (%) Totally Disagree……Totally Agree					MS	Rank
		1	2	3	4	5		
Infiltration of non-South African citizens	09(6.6)	12(8.8)	01(0.7)	07(5.1)	16(11.8)	91(66.9)	4.36	1.0
Large households	34(25.0)	08(5.9)	29(5.9)	16(8.8)	12(8.8)	37(27.2)	3.40	3.0
High poverty level	16(11.8)	11(8.1)	02(1.5)	20(14.7)	10(7.4)	77(56.6)	4.17	2.0

Table 5 shows the elements that contribute to the overcrowding of residents at Msholozi. The mean scoring rate of 4.36 indicated that residents from outside South Africa contribute to the rate of overcrowding at Msholozi. This is so because the study area is situated within the corridor that easily connects Mbombela city, which in turn provides easy access to travellers through the Lebombo Border gate to Mozambique and Oshoek gate to Swaziland. Since several Msholozi residents have been there since its establishment, this has resulted in Msholozi being an arrival place for Non-South African citizens whose relatives have been there for a long time. The study, however, did not focus on the impact that South African residents might have on overcrowding. Meanwhile, the mean scoring rates of 4.17 and 3.40 statistics of residents, respectively, are of the view that overcrowding at Msholozi is due to the high poverty level and large household size.

Plate 2: A typical decrepit residential environment in Msholozi

On further enquiry, respondents were of the view that there are households in Msholozi that are up to 10 persons living together in a room or two apartments. Plate 2 shows a typical decrepit residential setting in the study area which implies should several people be living in a house like this the consequence is overstretched facilities and health challenges.

Further analysis was made to unravel the roles played by Mbombela municipal officials (Departments of Public Works and Human Settlements) and the Ward Councillor on the prevailing situation in Msholozi. The reason for seeking their views was because of the known fact that the residents in Msholozi were occupying the land illegally. Thus, the need to establish whether the Department failed to ensure that the land is secured from illegal occupation and what strategies are in place to ensure that their immovable assets (land) are not vulnerable to illegal occupation and that their assets are utilised to their highest and best use. Additionally, since Section 26 (1) gives adequate housing rights to every citizen, what are the practical steps made, within accessible resources, to help citizens realise the right to housing progressively?

The responses from the city of Mbombela officials were coded 78 and 81 for the human settlement officer and the Ward Counsellor, respectively; while, the responses from the office of the Departments of Public Works and Human Settlements were coded 79 and 80, respectively. Responses from these participants were explained using quotations for ease of understanding. Accordingly, a participant (78) stressed that:

> their role in human settlement is to identify illegal settlements and collects the data of the inhabitants. They also determine the land ownership of land affected by informal settlements and liaise with the relevant department or state entities to release land. They also liaise with the human settlements Department to facilitate the development of plans to upgrade the illegal settlements and make a budget available for upgrading.

From the above, the roles of the human settlement division within the city of Mbombela included stemming the growing problem of informal settlement and enforcing adherence to standards in Msholozi. While the authorities may be excused for enforcing compliance to standards because illegality must not be encouraged, the same could not be extended to their inability to stop the development of informality in the first place at Msholozi.

Further to this, the role of the participant (81) was also stated as thus:

> … is to ensure that his ward is prioritised for projects to upgrade the informal settlements.

The above statement implies that the authorities have tacitly recognised Msholozi's informal settlement. Though the legality of the inhabitants is not recognised in the law, services that

make life meaningful must be extended to the people as claimed by the participant (81).

Again, research participant (78) added that part of the human settlement division role was:

> to support the inhabitants of Msholozi through the provision of water supply in Jojo tanks, as well as constant meetings to finalise upgrading plans, and for the Public Works Department to release the land and transfer it to the City of Mbombela.

The results show that the city of Mbombela's human settlement division is making effort to assist the people in formalising their status. The challenge has been how long will this process take. Getting the land from the Department of Public Works would make it easy to assist deserving residents in the study area. Similarly, the participant (81) indicated that:

> since he has been a Councillor, he has ensured that the project of electrification, boreholes and roads is implemented at Msholozi.

However, despite the efforts, research participant (81) reported that very little has been achieved as the area is still bereft of essential infrastructure. Thus, the government is aware of the poor living condition of the people in Msholozi but as noted by participant (81) actions to correct the imbalances are at a snail's speed.

Participant (78) chronicled the genesis of the Msholozi informal settlement:

> Msholozi emerged in 2008, and this was a result of people wanting to live closer to job opportunities. However, at a later stage, some political influence also increased the expansion of the informal settlements.

Additionally, the participant (78) states they:

> believes the policies are not proactive in preventing the occurrence of informal settlements and that some political office bearers use their authority to exacerbate the informal settlement. However, no proper corrective measures are taken against their actions.

From the views of research participants (78), the government is aware of the development of the Msholozi settlement. Since nothing was done to redress its occurrence at the infantile stage, politicians utilised the gap to exacerbate the growth.

The views of research participant (79) sought to unravel the Department of Public Works' efforts to forestall the illegal occupation of the Msholozi's land. Research participant (79) disagreed that the Department of Public Works failed to protect the land from illegal occupation and thus state that:

> the Department worked jointly with the then Mbombela local Municipality officials to seek legal actions. The court order was sought, unfortunately, amid the implementation of the court order, the Premier's office went to illegal invaders and assured them that they will never be removed from the property. In essence, the matter became political as it was during the time of the national elections.

The results again corroborated the earlier position that several occupants of Msholozi are illegal settlers. However, the challenge was that the illegality was tacitly supported by the government's inaction and political actors doing the same for popularity and political gain. Again, research participant (79) notes:

> that the Department of Public Works planned to transfer the subject property (lands) to the City of Mbombela and has sought the Ministerial approval to do a gratis transfer of the property.

The statement of the research participant (79) suggests that the major challenges faced by informal settlement establishments will take a long time for the government to resolve. This is because land availability is a challenge, and the majority of people want to have land. Another challenge is the fact that there seems to be a misunderstanding between land administrators (officials) of the two Departments, the city of Mbombela and politicians.

Further to this, the views of the research participant (80) were sought. This is necessary because the Department has an obligation that is placed on it from the national sphere of government to ensure that section 26 of the Constitution of the Republic of South Africa is achieved. It must, however, be noted that the Department of Human Settlement is different from the division of Human Settlement in the city of Mbombela. While the latter draws its authority from the Mbombela municipality, the former derives its authority from the national government.

Relative to meeting the goals of the Department as enshrined in the constitution, research participant (80) states that

> the Department is meeting its obligation as set out in the constitution, and the reasons for the emergence of Msholozi informal settlements may be because the Province doesn't have sufficient funds in its budget to cater for all housing needs. Another reason is the issue of the unavailability of land for human settlements development from the government since most of the land is privately owned and expensive to procure, and there is no proper coordination between the key players in addressing the challenges of informal settlements.

The position of the research participant (80) corroborated earlier findings that lack of synergy among key players is the bane of resolving the conflict that the Msholozi informal settlement has caused. Again, the research participant (80) notes that

> the Department has interacted with the residents of Msholozi, and this was done through the municipality. Additionally, the community/residents are aware of the government's planned development of the area, however, the delay is caused by a paucity of funds

The above data suggest that the Department of Human settlements do have upgrading plans for the Msholozi informal settlements. However, financial constraints have delayed the planned upgrade. The findings in this study corroborated an earlier South African study by Mutero & Makwara (2018), which found government complicity in the genesis and growth of the informal settlement. Thus, if governmental neglect is the bane of citizens having a salubrious and liveable residential environment in South Africa, necessary steps must be taken to redress the anomaly.

6.0. Conclusion and Recommendations

This paper intended to identify the genesis of, and the environmental challenges affecting the people of Msholozi informal settlements, Mbombela. It is worth stressing that the environmental challenges affecting informal settlements globally, though, common, context and way of life of the people relative to a particular geographical location warrant a study of this nature. The study revealed that certain elements contribute to the growing environmental consequences of the Msholozi informal settlement. The proliferation of people in the study area, without proper documentation, is the major cause of environmental

challenges such as air pollution, overcrowding and inefficient waste management. In this study, air pollution is a consequence of unserviceable vehicular fumes, and fuel woods among others.

It must, however, be stressed that the environmental challenges of the Msholozi informal settlement are not the only concern of this study. The causes of informal settlement that are perceived to be the leading pointers to the growing environmental challenges were understudied. The main motivation was that understanding and dealing with the leading causes of the informal settlement will provide a viable solution to the problem. Accordingly, the officer in charge of city of Mbombela's human settlement, the Ward Councillor and officials of the Departments of Human Settlements and Public Works that are familiar with the issue were interviewed. Findings reveal government and residents' complicity in the growth of the Msholozi informal settlement. Unfortunately, this has lingered for too long leaving a bastardised environment with the residents negatively impacted.

To correct the problem of Msholozi's informal settlement, therefore, immediate steps that are devoid of insincerity must be taken. The government must be a key player and must provide good leadership and enabling environment for all parties to wholistically discuss and proffer solutions to the problems. The recent political solutions to the Msholozi, informal settlement could not be achieved because of complacencies and lack of willpower of the concerned officials. Accordingly, the following are some of the options, if taken, that might provide permanent solutions to the problem of the informal settlement in Msholozi and the rest of South Africa. These include (1) calling for stakeholders meeting to understand the genesis of the problem; (2) educating all parties on the consequences of their actions to the environment and the inhabitants; (3) promoting agreement among the stakeholders on their roles and responsibilities towards tackling the challenges; (4) taken the census of the residents to aid the government in decision making. This will help to identify residents' tenurial status and eventual removal of non-citizens without legal documents from the republic of South Africa.

While the arrangement is being made to initiate and follow the aforementioned suggestions, immediate measures are needed to stem the menace. The City of Mbombela must create a dumping site that will be specifically designated for the residents of Msholozi. This will, in turn, minimise the dumping of garbage by the residents indiscriminately within the settlement. There is a need for a related study in the future which must focus on unravelling the implication of the Msholozi informal settlement on the health of the residents. As previously observed, undertaken a study must be with the motive of either breaking new ground or confirming/disproving findings of earlier studies.

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GENERIC COMPETENCE DEVELOPMENT IN REAL ESTATE GRADUATES IN MALAWI

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Abstract

Globalization and technological advancements have brought unprecedented changes in the business environment. To remain relevant and gain competitive advantage, many real estate firms are shifting to unusual ways of doing business and adoption of new business models. Recruiting highly skilled real estate graduates is one of the fundamental requirements for the success of many real estate firms. This has resulted in increased levels of unemployment and layoffs among real estate professionals due to skills mismatch. Possessing academic qualifications alone is therefore no longer sufficient enough to guarantee employment for real estate graduates. This study used a mixed method design to investigate generic competence required of real estate graduates in Malawi.

Primary data was collected using questionnaires. 19 heads of sections from various real estate firms completed and returned the questionnaires. Data was analyzed using Microsoft excel and content analysis. The study found that all the thirteen generic competences used in the study were essential to real estate firms in Malawi and that professionalism and ethics, property inspection skills, data management, team work among others are the key competencies required by Malawian real estate employers. However, the study revealed that Malawian real estate graduates are deficient in four out of thirteen generic competences. It is therefore recommended that these deficient skill sets should be incorporated in the real estate curriculum.

Key words; Generic competencies; real estate graduates; employability; real estate employers.

1.0. Introduction

1.1. Background of study

The world has experienced rapid changes in technology, business dynamics and increased competitiveness which has brought unprecedented transformation necessitating the need for new skills (Dolce, et al., 2019). Egbenta (2015) states that possessing academic knowledge alone is no longer adequate for graduates to enhance their job prospects and be able to sustain the job once secured. Farhad, Amjad & Bibi (2018) argue that employers are more concerned with what graduates can do than what they know. Fundamentally, generic competencies are the underlying skills prerequisite for graduates' transition to work in the modern world. Jackson (2013) notes that generic competencies are acquired at the university and are transferable. This means, these skills can be applied to different situations in work places. Jackson (2013) further points out that generic skills include the attributes, capabilities, social, cognitive, self-management and administration skills needed for a graduate to apply their disciplinary proficiency when working.

Wilkinson et al., (2018) and RICS (2015) argue that change in real estate is inevitable, therefore professionals must match the changing needs of competitive market environment and develop a culture to embrace new technologies. Real estate firms around the world are adopting unusual working practices and new business models to off-set the changes and maintain a good share of the competitive market (Wilkinson et al., 2018). These business models include new collaborations, virtual platforms and remote working. Phillips & Roper (2009) posit that in this era of intellectual capital, most real estate firms are interested in employing and retaining graduates with a portfolio of skills to make profits and survive the competitive real estate environment. RICS (2020) adds that it is important to evaluate the ways in which graduates who are the professionals of the future join real estate profession in order for them to remain competent and relevant now and in future.

Al-Harthy et al., (2015) argue that producing work ready graduates is vital for the growth and expansion of real estate industry. Furthermore, Wilkinson et al., (2018) add that valuers must develop new generic competences to have a diverse skill base for the future professional success. This is because the emerging trends and advancing technologies have brought with it positive contributions in real estate sector and therefore professionals must not fear but get prepared for it (RICS, 2015). This calls for the associated stakeholders such as employers, real estate educators and regulating bodies to work together in attracting and educating real estate graduates into reliable professionals (Wilkinson et al., 2018).

Bridgstock (2008) notes that there exists a strong interdependence between real estate education system and the employers as the out-put of the education system forms the input for the industry. Therefore, education of real estate professionals has always been of great interest to the employers and other stakeholders (Amadu et al., 2018). Zrobek & Grzesk

(2013) posit that real estate universities will have to gradually change their role towards supplying an up-to-date pool of professionals with wide range of competences. Regardless of the country and its local real estate regulation, generic competences required for one to practice as a real estate professional will become mandatory in few years (Zrobek, Kucharska-Stastiak & Renigier-Bilozor, 2020). Zrobek et al., (2020) further point out that embracing and modernizing what real estate graduates are learning is a matter of urgency.

Studies have emerged across the world studying modern real estate dynamics and the competence requirements of real estate firms. For example, Wilkinson et al., (2018) identified ICT, interdisciplinary skills, market forecasting skills and advanced data analysis technics as the most needed competences in Australia whereas Azasu et al., (2018) found that facilities managers ought to have advanced knowledge in numeracy skills, ICT, data analysis and communication skills in South Africa and Mirembe & Viruly (2018) found that real estate professionals demonstrated 10 out of 21 key knowledge areas in Nigeria. Mirembe & Viruly (2018) state that the fundamental issue in real estate practice within the Sub-Saharan region is the shift in skills and knowledge base necessary to off-set the changes within the region. This is however based on mature real estate markets for the whole region. Dolce et al., (2018) argue that real estate practices for individual countries remain essential to meet future expectations within their context.

Real estate firms are interested in employing graduates with diverse knowledge and skills to survive the competitive market environment (Phillips & Ropper 2009). Expectations of real estate firms differ among countries; therefore, it is important to ensure that their expectations are known in order to enhance education and future employability of real estate graduates (Mirembe et al., 2018). Several studies have been conducted to assess market expectations of real estate graduates around the world (Yasmin et al., 2012; Oledokun et al., 2017; Azasu et al., 2018). However, there is paucity in the literature as to what competences Malawian real estate graduates should possess from employers' perspective in Malawi. Therefore, this study sought to answer the question; what are the generic competences required by real estate graduates' employers in Malawi by investigating generic competence development in real estate graduates in Malawi. The study had the following objectives; exploring practices adopted by real estate firms to adapt to the changing work environment; evaluating main generic competences required by real estate employers in Malawi and examining adequacy of real estate generic competences in real estate graduates.

2.0. Literature Review

2.1. Background

The changing business dynamics, globalization and technology have significantly necessitated the adoption of new business models, practices and technologies in order for firms to succeed in the challenging global arena (Fatma et al., 2015). Pumphrey & Slater

(2012) state that it is imperative for employees to develop and possess adequate generic competences to adapt the new working environment. Graduates with a wide range of generic skills are better placed to meet job requirements and enjoy economic stability (Pumphrey & Slater, 2012). However, these generic competences are not the same throughout the globe as they differ among countries (Mirembe et al., 2018).

2.2. Definition of generic competences

The application and usage of the term generic competence varies widely and its meaning differs among countries across the world (Pukelis & Pileicikiene, 2009). In some countries, these skills are linked specifically to employment while in others much focus is placed on their social importance (NCVER, 2013). Some authors refer to it as key skills, transferable skills, core skills, generic skills, employability skills, generic attributes, transversal competences, 21st century skills and soft skills (Pukelis & Pileicikiene, 2009; Sa & Serpa, 2018; UNICEF, 2019). Table one below shows different terms used for generic skills in different countries.

Table 1: Terms of generic skills in various countries source from NCVER (2013).

Country	Terminology
United Kingdom	Core skills, key skills, common skills
New Zealand	Essential skills
Australia	Key competences, employability skills, generic Skills
Canada	Employability skills
United States	Basic skills, necessary skills, workplace know how
Singapore	Critical enabling skills
France	Transferable skills
Germany	Key qualifications
Switzerland	Trans-disciplinary goals
Denmark	Process independent qualifications

The concept “generic competence” was firstly presented by Robert White in 1959 who described it as the attributes an individual may possess which can be associated with the highest level of motivation and superior job performance. This was backed by using a broader motivational theory which associated motivation directly with competence through an individual's ability to produce desired results. He claimed that the emotional experience

resulting from efficacy may motivate the individuals to direct their behaviours towards developing and achieving competence (Winterton et al., 2006). McClelland (1973) defined competence as an individual's ability to perform a task effectively. He further adds that employees must be hired based on their level of competence and not based on the intelligence and aptitude test. Subsequently, the definition of generic competence in the modern world has been framed in the context of personal characteristics, relationships, motivation and emotions (UNICEF, 2019).

Ananiadou and Claro (2009) point out that competences are more than just knowledge and skills as they include one's ability to draw and mobilise resources to remain effective in this era of knowledge base. Definition of competence by Ananiadou and Claro (2009) is well supported by the earlier "Knowledge, Skill and Ability" (KSA) competency approach. In KSA approach, Winterton et al., (2006) define a competent person as someone who has knowledge, skills and abilities to adapt and work effectively in a changing work environment. Bridgstock (2009) describes generic skills in two ways thus; those attributes that relate to an individual's ability to participate effectively in society works as good citizen, and skills that enable an individual to obtain and maintain work and contribute towards economic productivity

2.3. Evolution of real estate education in Malawi.

Malawi is a landlocked country in the Southern part of Africa with an estimated population of 18 million . Despite being one of the poorest countries in the world, Malawi is among the countries with highest rate of urbanization (UN-Habitat, 2011). Major investors in real estate include the government, local as well as international institutional investors. The property market consists of both formal and informal economic agents such as Knight Frank and Press Properties (Cloete & Chikafalimani, 2001). The expansion in the real estate market has seen more projects and stakeholders such as ERIS Properties, Alliance Properties and ICON Properties entering the market (UN-Habitat, 2011).

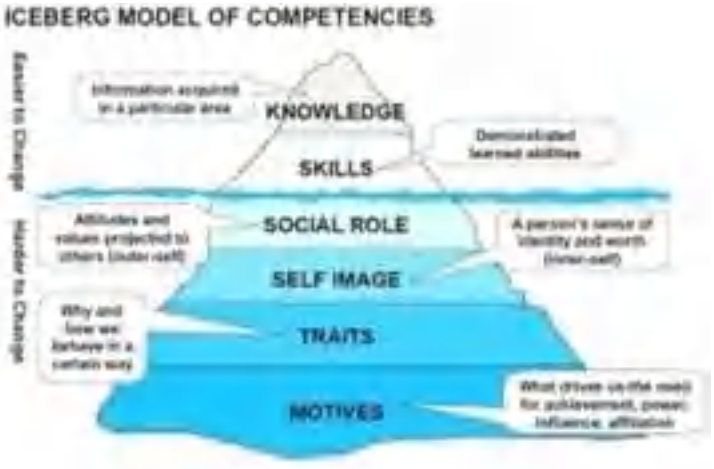
Cloete & Chikafalimani (2001) argue that real estate education in Malawi evolved from the British system which based real estate education on the general practice of surveying, planning and development. Until multiparty system of government was introduced in 1964, real estate profession begun to mushroom. During which period real estate services were being provided by a small group of professionals from other disciplines within and outside built environment. The following decade marked a revolutionary change in professional services in real estate due to the emergency of a properly functioning real estate market in the country (Cloete & Chikafalimani, 2001). Advancement in technology and the need to improve service delivery for sound decisions in real estate investment also necessitated a turn-around in real estate practice. Within this period, the education and teaching of real estate also evolved from knowledge sharing among professionals to a formalized training and consequently to an ever-improving academic teaching at institutions of higher learning (Manda & Matidza, 2015).

Previously, real estate education was being attained outside Malawi, for example, United Kingdom and South Africa. As late as the year 2000, Natural Resources College begun the first certificate program in real estate, specializing in land administration while Mzuzu University (MZUNI) first degree program began in 2006 (Manda & Matidza, 2015). In 2009, Malawi University of Business and Applied Sciences (MUBAS) formerly University of Malawi the Polytechnic commenced its undergraduate degree program in real estate. These institutions of higher learning have since produced real estate graduates who are currently serving real estate sector with some holding important positions both in private as well as public institutions (Polytechnic, 2016).

2.4. Theoretical foundation in understanding real estate competences

Pukelis & Pileicikiene (2009) categorize generic competences into professional and core competences. They defined professional competences as the technical expertise that are needed for one to perform a specific task, while core competences are termed as those skills that are flexible and are essential for the success of an organisation. Sa & Serpa (2018) add that beside core and professional competences, generic competences can also be described by behavioral approach. They claim that competences are fundamentally the effective professional behaviours or traits demonstrated by an employee that allows him/her to have a superior job performance. Shree, Lakshmi & Ramaya (2016) advocate the use of iceberg model to emphasize and visualize the concept of generic competences. Figure below illustrates iceberg model.

Figure 1: Iceberg model representing generic competences (Shree et al., 2016)



Just like a partially submerged ice, the iceberg model has two parts divided by the water line one of which is visible and the other part is below the waterline. The technical knowledge and skills which are the essential elements of KSA model of competency are on top of the waterline. These skills are visible and therefore easy to assess and change (Shree et al., 2016). Shree et al., (2016) further argue that the behavior competences are underneath the

waterline and therefore not visible. These include self-image, traits and motives which are very difficult to develop.

Chung & Wu (2010) point out that competences above the water line are influenced by the ones below the line. For instance, all the things that motivate an employee will likely influence how that employee uses their skills and knowledge when performing a task. Bridgstock (2009) summaries the model as follows;

2.4.1. Knowledge - all the information necessary for an employee to perform a task in a particular field effectively;

2.4.2. Skill - the employee's ability to demonstrate what he/she learnt;

2.4.3. Social role/ Values - an individual's perception about the world and people around him;

2.4.4. Self-image- people's perception about themselves, this includes identity and worth;

2.4.5. Traits- relates to how and why someone behave the way he/she does;

2.4.6. Motivation- what drives us to perform a certain task.

2.5. Importance of generic skills

In this era of knowledge economy, several changes in the working environment have been noted and this includes technological advancements, increased globalization and increased layoffs among real estate employees (RICS, 2015). The world has consequently witnessed a significant increase in employers' requirement for skills (RICS, 2020). The dynamism and complexity in the business environment has forced many employers to employ graduates on the basis of the underlying skills they possess and not just the academic qualifications (World-Economic-Forum, 2020). Pumphrey & Slater (2012) point out that graduates with a wide range of generic skills are better placed to meet job requirements and enjoy economic stability.

In order to remain competitive and maintain a good share of the market, many firms are forced to review their systems of managing resources to ensure customer satisfaction (Pumphrey & Slater, 2012). Most of the companies are adopting unusual business models such as new collaborations, adoption of more flexible work approaches, improved service delivery techniques and operating in multiple markets (Wilkinson et al., 2018). Pumphrey & Slater (2012) add that those employees that demonstrate adequate generic skills are capable to adapt to new responsibilities and assignments. Employees who possess generic competences are characterized by superior work performance and timely work delivery (RICS, 2015). Effective work performance promotes firms' productivity and profitability (Pumphrey & Slater, 2012).

2.6 Generic competences and employability

Moreau & Leathwood (2016) defined employability as the likelihood of a graduate to secure employment and progress in that chosen position which directly benefits himself/herself, the society and the employer. Holtzhausen (2012) stated that employability is the ability of a graduate to maneuver and progress within the work setup to achieve the highest potential by way of sustainable employment. The chances of a graduate securing employment depend upon the knowledge, skills and abilities the graduate has (Peeters et al., 2019). UNICEF (2019) point out that graduates who lack competences have lower chances of securing, sustaining and progressing in their job positions in this era of technological advancements.

The link that exists between generic competences and employability is expounded in the employability capital matrix (Peeters et al., 2019). This matrix emphasizes the likelihood of a graduate to secure and maintain an employment because of the human and social capitals. Shree et al., (2016) points out that human capital are personal related skills such as job specific career and learning skills while social capital includes the network and relationships that a graduate has with other people around him or her. Below is the employability capital matrix illustrating the link between generic competences and employability.

Table 2; Employability Capital Matrix. Source; Peeters et al., (2019)

Category	Job specific skills	Career Related skills	Development skills
Human capital Knowledge	Knowledge needed for a graduate or employee to perform his/her job	Knowledge needed for one to manage career and transition to work	knowledge needed for one learning new skills in order to adapt to changes
Human capital Skills	skills needed for one to carry out a job	Skills needed for a graduate to find a job	skills required for one to adapt to changes
Human capital attitudes	Attitudes that are required to do a job	attitudes needed to manage a transition	attitudes necessary to adapt
Social capital	Network of people a graduate needs that may help him/her perform effectively	a network that a graduate needs which may help in job transition	a network of people that may help a graduate to adapt to changes

Peeters et al., (2019) claim that graduates with the relevant knowledge, skills, attitudes, networks and relationships are able to adapt to changing work environment and Holtzhausen (2012) adds that employability is directly influenced by the knowledge, skills and attitudes that a graduate possesses and the subsequent way in which the graduate uses these competences when presented to possible employers within the labour market.

2.4. Real estate generic competence expectations across the world.

Skill mismatch is one of the major concerns to employers seeking to recruit competent and proficient real estate graduates (Egbenta, 2015). Velciu (2017) defines skill mismatch as the difference between the skills possessed by graduates and the skills required by the potential employer. Oluwatobi et al., (2017) suggests that there is a shortfall of skills and competences in real estate graduates as compared to the needs of the sector in developing economies. This persistent skill gap in graduates continue to negatively affect firms' global competitiveness and effective performance (Jackson, 2013).

A report by RICS (2020) revealed that the changing business environment driven by technological advancements, new business models and globalization has led into increased demand for new skills from employees. Examining employer needs and expectations is paramount in ensuring that graduates develop desirable competences necessary in the reduction of skill gap (Pang, et al., 2019). Several studies investigating employer expectations have been undertaken in various countries. For example, Jiram et al., (2016) investigated the adequacy of the competences infused in real estate courses with regard to employer expectations in Malaysia and found that moral and professional skills is ranked first by the employers, while working skills, life-long learning and information management skills were ranked second, third and fourth respectively. In their study, Adnan et al., (2016) also found that ethics and professionalism was the most important skill followed by critical thinking, teamwork, learning skills and information management skills.

Table 3: Employers' ratings of graduates' skills as sourced from Adnan et al., (2016)

Skill	Weight
Ethics and Professional	19%
Critical thinking and problem solving	17%
Team work	15%
Lifelong learning	14%
Information Management	10%

In their study Robson et al., (2015) reported that there exists a mismatch in skills possessed by graduates and the expectations of real estate employers in Australia. The authors stated that Australian graduates required additional specialist training before they can be considered work ready. Furthermore, Poon (2014) found that the skills that are considered important by real estate employers include rural property valuation, effective written communication skills and practical experience. Additionally, commercial awareness is another important skill that was lacking in real estate graduates in Australia.

Ameh & Chukwujekwu (2020) found that there is an alarming proportion of unemployed built environment graduates in Nigeria despite shortage of skilled labor as employers are facing recruitment challenges due to skill gap. This is complemented by Abiodun et al (2015) who carried out an investigation on skill expectations of estate management graduates and found that out of 10 skills listed, teamwork, negotiation skills, communication skills, report writing and problem-solving skills were the most important skills needed by the employers. This finding was supported by Oluwatobi et al., (2017) who found that estate management graduates ought to have oral presentation, learning and adaptability skills.

In Oladokun & Gbadegesin (2017), it is reported that real estate graduates in Lagos metropolis understood and demonstrated adequately in 6 out of 10 key skills. This was achieved by interviewing managers of real estate practicing firms who ranked listening and communication skills as the highest demonstrated skills by the employees. They however reported that the employees are deficient in logical thinking, writing skills, courteousness and negotiation skills whereas Egbenta (2015) found that estate management employees lacked problem solving skills, numerical and reasoning skills.

Ampofo-Anti (2007) evaluated the National Qualifications Frameworks (NQF) of South Africa to assess if graduates were equipped with skills that match the framework. He found that the current trends demand the built environment sector in South Africa to be equipped with skills necessary to offset the threats and respond favourably to the opportunities created by the 21st century business environment. Despite the skills matching the framework, the author recommended for a further investigation to assess if the skills matched the employers' needs. Azasu et al., (2017) sought the views of South African stakeholders on the expectations of facilities management graduates and found that the graduates' ability to work independently, teamwork, oral communication, analytical skills, systems thinking and commercial awareness are the most important skill requirements.

However, expectations of real estate employers in Malawi are not known despite Manda & Matidza (2015) and Polytechnic (2019) carrying out tracer studies to explore the employment status of graduates in the country. Manda & Matidza (2015) suggested that the majority of the land management students who graduated from Mzuzu University from 2011 to 2015 secured employment within two years after graduation. Despite minimal number of these graduates, some remained unemployed regardless of several vacancies within the real estate sector (ibid, 2015).

The 2016 Polytechnic graduates' tracer study revealed that three years after graduation, only 11 % of built environment graduates secured employment (Polytechnic, 2019). The study further reported that the graduates were satisfied with the competences they developed while at the University (Polytechnic, 2019). However, it is not known as to whether the competences obtained by the real estate graduates are relevant to real estate employers.

3.0. Research Method

3.1. Research design

This study employed a mixed method approach to gain a clear picture of the research problem since the combined approaches complement each other (Saunders et al., 2016; Kumar, 2011; Creswell, 2013). As the qualitative approach was used in examining the generic skills possessed by real estate graduates, the adequacy of generic skills possessed by real estate graduates was examined quantitatively.

3.2. Sampling techniques

The study adopted a purposive sampling technic in selecting the population sample (Saunders et al., 2016). Therefore, the heads of departments and human resource managers of the sampled firms and government agencies were incorporated as participants to the study.

3.3. Sample size

This study focused on the major employers in the real estate sector in Malawi such the government in the Ministry of Lands, Housing and Urban Development and Malawi Housing Cooperation and major private real estate firms in the country. These companies and departments were chosen because they employ more real estate graduates in the country.

3.4. Data collection methods

This study collected both primary and secondary data (Creswell, 2013). Primary data was collected through structured questionnaires. While secondary data was collected through desktop review of books, journals and other sources available for public benefit. Micro Soft Excel was used to analyze quantitative data while content analysis was used for analyzing qualitative data. After analysis, the data was presented in graphs, charts and tables for easy and logical interpretation.

3.5. Ethical Considerations

Before study questionnaires were administered to the respondents, consent was sought and those that were not interested to take part in the study, their reservations were respected. Furthermore, the questionnaire had an optional question asking the respondents whether

they wanted to proceed in answering the questions or not and throughout the study, the respondents were treated with utmost confidentiality and necessary citations and referencing have been made on all secondary data used.

4.0. Research Findings and Discussion

4.1. Demographic information

Demographic data was collected to understand participants in line with their competence expectations in real estate graduates. Data collected included work experience, roles in their organizations and the general information of their organization. A total of 7 real estate organizations participated with heads of sections as respondents.

A sample of 25 heads of sections were purposively sampled and 20 questionnaires were returned with 19 completed and one not completed) representing 76% response rate. Saunders et al., (2016) point out that response rate of 35-40% in academic studies involving top management or firm's representatives is reasonable to achieve reliable results. The uncompleted questionnaire was disregarded.

4.2. Sector of respondents and their work experiences

The study found that 10 of the respondents were in public sector while 9 were in private sector. The data set results were therefore slightly weighted towards respondents coming from public sector. This is essential as the findings represent the views of both public and private sector on real estate generic competencies in graduates. Furthermore, the study found that all the respondents had work experience ranging from 5 to 15 years. This signifies the validity of their responses to the study.

4.3. Business models adopted by real estate firms in Malawi

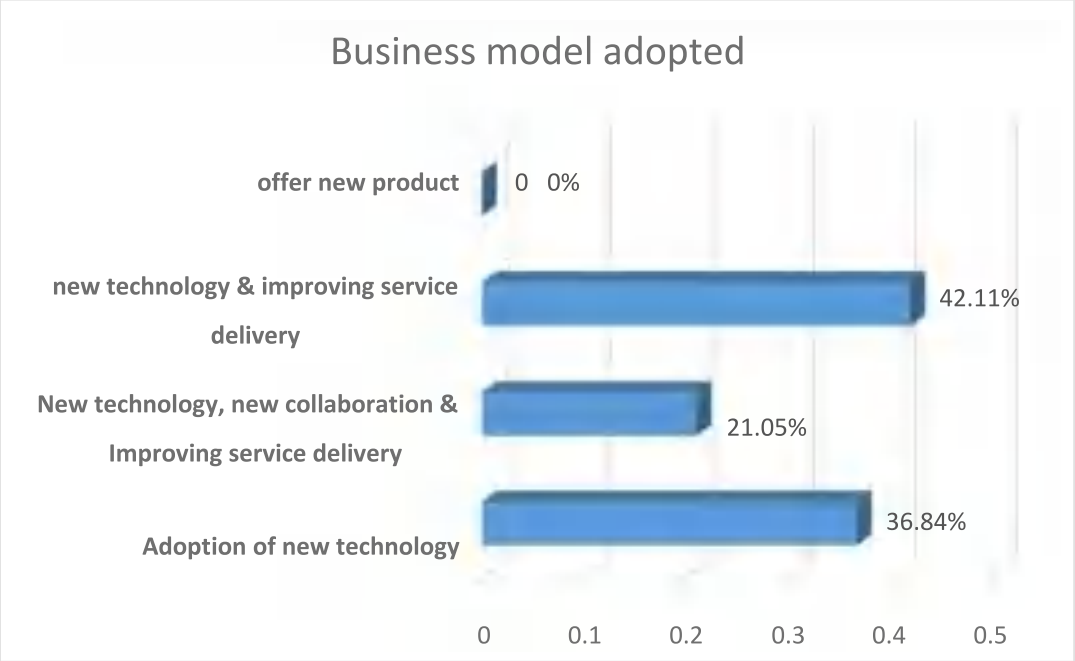
The study further sought to explore practices adopted by real estate firms to adapt to the changing work environment in the country. These included adoption of new technologies, new collaborations, offering new products and improving service delivery ..

The study found that new technology, new collaborations and improving service delivery are the business practices the real estate firms have adopted in Malawi. eight of the respondents indicated that their firms had adopted new technology and improving service delivery; seven of the firms had adopted new technology and four of the respondents had adopted both a combination of new technology, improving service delivery and new collaborations. It was found that none of the respondents indicated offering a new product as way of adapting to the changing business environment.

Fatima et al., (2015) found that increased competition among real estate firms due to

advancement in technology and globalization has forced many real estate firms to change their ways of doing business. For example, adoption of technologies such as the Internet of Things (IoT), Artificial Intelligence and robotics in property management and use of Computer Aided Mass Valuations, new business collaborations are some of the practices adopted by many firms around the global to offset the negative impacts of these changes (RICS, 2020).

Figure 5 showing business models adopted by real estate firms in Malawi. Source field data



4.3. Level of importance of generic competences to real estate employers

Furthermore, the study sought to evaluate main generic competences needed by real estate employers by developing a framework of competences needed by real estate employers which was informed by the literature. These competences included professionalism and ethics, property inspection skills, report writing, effective communication skills, data management, team working skills, IT skills, reasoning and problem-solving skills, rural property valuation, advanced data analyzing skills and property market forecasting skills. Respondents were asked to rate the level of importance of each skill on a 5-point Likert Scale, where generic competences that rated 3, 4 and 5 were important, very important and critical respectively. The test value for analysis of the results was 3, meaning that all competences ranked above this test value were needed by the employer, while any skill rated below the test value was considered not needed or not applicable.

The study found that all the 13 generic competences were above the test value hence needed by real estate employers. However, the study further found that 6 of the generic competences were ranked between very important to critical. This means the employers expected real estate graduates to demonstrate adequately in those 6 competences. These included professionalism and ethics, property inspection skills, report writing, effective communication skills, data management and teamwork. This agrees with Jiram et al., (2016)'s findings which revealed that real estate firms require real estate graduates to be skilled in effective communication and professionalism and ethics among others. Similarly, Abiodun et al., (2015) found that effective communication, report writing and teamwork were among the 10 generic competences needed by Nigerian real estate employers. Furthermore, RICS (2015) state that meaningful contribution towards adaptation to the changing work environment emphasizes the duty of real estate graduates to perform adequately in data management, effective communication, property inspection and involve others in day-to-day operations. Figure below summarizes;

Figure 6 showing level of importance of generic competences in Malawi. Source field data.

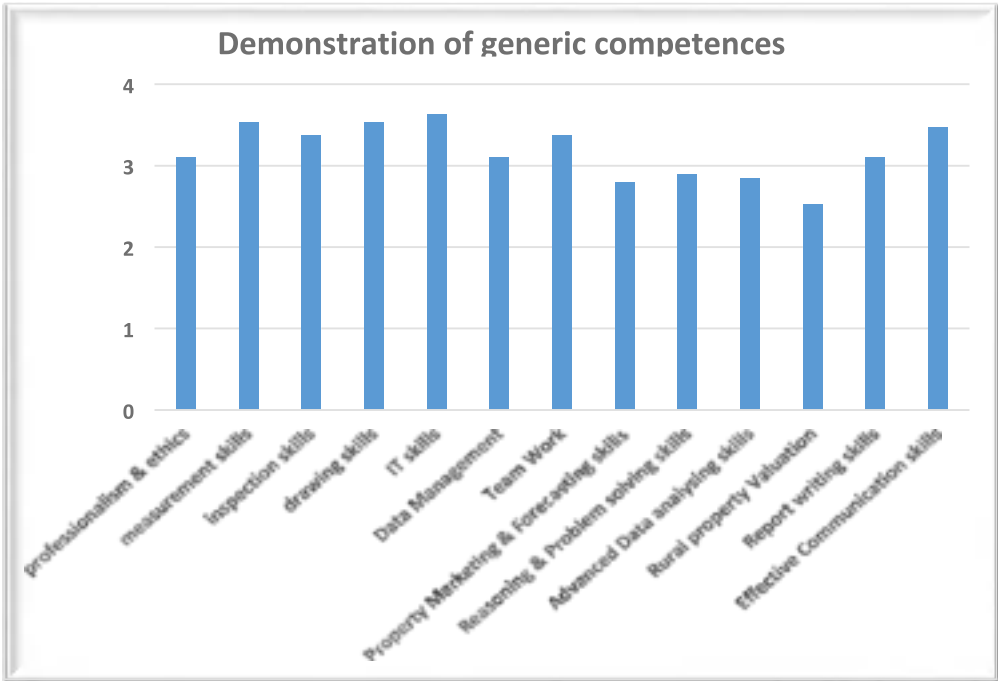
The study further revealed that professionalism and ethics was the topmost needed competence by real estate employers. This competence requires that real estate graduates must be well versed and demonstrate highest level of professional standards, honesty, trust and care. This agrees with RICS (2020) reported which stated that adherence to ethics and professional standards offers a strong base for a competitive advantage for many real estate

organizations in the modern world. In this era of knowledge base and competitive environment, too much pressure is put on many real estate employers to promote professionalism and ethics among their employees (RICS, 2020). All the respondents revealed that professionalism and ethics was highly recommended among real estate firms. One respondent emphasized that; "…there are many organizations out there competing with us for the same clients, so our priority is to promote professional conduct among our employees in order to provide best and high-quality services to our clients..."

4.3. Level of demonstration of the generic competences by real estate graduates

Study participants were asked to rate the level of competences demonstrated by the real estate graduates on a 5-point Likert Scale, where any point from 3.5 above were regarded adequate, any skill demonstrated between 3 to 3.4 were regarded as fairly demonstrated, while any level below this test value were deficient. The study found that the real estate graduates only demonstrated adequately in four out of the thirteen generic competences. Figure below presents the competences highly demonstrated by real estate graduates in Malawi. These are; IT skills, drawing skills, measurement skills and effective communication skills.

Figure 7 showing level of demonstration of skills by Malawian real estate graduates, source field data



The findings further reveal that real estate graduates are deficient in property marketing and forecasting skills, reasoning and problem-solving skills, advanced data analyzing skills and rural property valuation skills. Study participants expressed dissatisfaction with the level of competences demonstrated by real estate graduates in Malawi in these areas. These findings somehow agree with what Poon (2014); Oledokun & Gbadegesin (2017) and Egbenta (2015) who found that real estate graduates lacked rural property valuation skills, logical thinking, problem solving skills, numerical and reasoning skills in Australia and Nigeria respectively.

5.0. Conclusion And Recommendations

The overall aim of the study was to investigate generic competences development in real estate graduates in Malawi. The research aim, objectives and questions were answered by administering an open ended and close ended questionnaire to real estate graduate employers. Generic competences are regarded as a base for the growth of real estate firms, client satisfaction, employee effective performance, competitive advantage and productivity. The changing work environment has brought with it various challenges such as un-employability and increased layoffs among real estate graduates. This is due to skill mismatch between the employers and real estate graduates. Furthermore, the study has revealed that all the thirteen generic competences evaluated in this study are essential to real estate firms in the country. However, the study has revealed that real estate graduates in Malawi are deficient in four generic competences which are property marketing and forecasting skills, reasoning and problem-solving skills, advanced data analyzing skills and rural property valuation skills.

Therefore, to enhance employability and work sustainability among real estate graduates, this study recommends that;

5.1. Recommendations

5.1.1. Institutions of higher learning should incorporate skills found deficient in real estate graduates in their curriculum to enhance employability;

5.1.2. Institutions of higher learning should develop generic competence framework in line with the needs of real estate graduates' employers that should be used when assessing performance of real estate students during industrial attachments;

5.1.3. There should be constant engagement between real estate firms and the institutions of higher learning to give feedback on the generic competence performance to enhance skills development in the students still in the Universities;

5.1.4. Real estate firms must provide on-job training to real estate graduates in order to promote the development of the necessary generic competencies;

5.1.5. Real estate graduates must endevour to develop the most needed generic competencies by identifying and learning from mentors for them to remain relevant.

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CHALLENGES AND OPPORTUNITIES OF HOUSING FINANCE IN SUB-SAHARAN AFRICA. A LITERATURE REVIEW ON URBAN HIGH-RISE RESIDENTIAL HOUSING

Abstract

The paper identifies knowledge gap on housing finance literature in Sub-Saharan Africa through the lens of Malawi to enhance ongoing discussions on housing crisis in the global south. The study distinctly focuses on affordable urban high-rise housing (AUHRH, henceforth), being a land efficient option to affordable housing as opposed to horizontal housing, and for the first time within the region. Desk study approach was adopted where peer-reviewed research works were studied to explore the housing issues and identify gaps in literature on the subject matter. Literary findings confirm qualification of finance as the crux of affordable housing supply challenges in the region, with traditional financing proving to be exclusionary to middle and lower income earners. The other key gap is on crowdfunding. While being christened as the best option for AUHRH with largest market share through diaspora remittances in the region, crowdfunding has not been employed in housing finance this far. Instead, Micro Finance Institutions (MFIs, henceforth) are taking the lead by providing more flexible source of housing finance though not for AUHRH. The identified gaps point to a need for empirical study to understand critical issues with regards to adopting innovative financing options especially real estate crowdfunding (REC, henceforth) in Sub-Saharan region. Key areas under such an intervention include legislation, viability, and determination of critical mass for investor participation. The study, therefore, forms a basis for future studies in this subject and on the continent.

Keywords: Innovative funding, Real Estate Crowdfunding, High-rise Housing, Traditional finance, and Affordable Housing.

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1.0. Introduction

Lack of affordable housing continues to advance into an outright global crisis where developing countries remain in the worse off state (United Nations, 2019). Over the past decades studies have been undertaken to understand the nature, causes and solutions to affordable housing problems (CAFH, 2019; Bah et al, 2018). While the right to housing has been shown as a globally enshrined entitlement to all humans, the status quo shows that governments remain indebted to their citizens (ibid, 11). Literature has widely documented lack of finance as the main cause of housing shortage (Carey and Tshangana; 2020b, Hoek-Smit, 2012; Adabre et al. 2020) besides other factors namely: expensive mortgage loans, excludable financing options, lack of subsidies, high cost of informal building materials, shortage of land, population boom, poverty, urbanisation and lack of infrastructure development finance to support private sector investment.

In Africa, existing financial impediments limit both private sector and governments' ability to provide affordable housing (Kajimo-Shakantu and Evans, 2006; Carey and Tshangana; 2020b; Limba, 2018). Also, what these players can do for affordable housing provision is restricted by the forces of liberalised housing market enshrined in land policies in most of the countries in the region (World Bank Group, 2015; Tshangana and Carey, 2019).

Malawi uniquely joins the rest of Africa in having a year to year housing backlog with under 2% mortgage loan access and 4% more housing loan cost compared to Southern Africa's average of 17% (Centre for Affordable Housing Finance in Africa Yearbook, 2017; 2021; UN Habitat, 2010; Carey and Tshangana; 2020b). Resultantly, housing supply has been restrained to under 2, 000 constructed units while formal housing deficit as at year 2015 sits in excess of 100, 000 (Tshangana and Carey, 2019; UN Habitat, 2015). The status quo has forced massive adoption of horizontal housing developments as a cost cutting measure (Japan International Cooperation Agency Report, 2010). However, for a small-landed and overpopulated Malawi, this route is not sustainable.

In curbing this problem the government introduced high-rise residential zones within Lilongwe city boundaries to accommodate up to eight storeys of largely medium density housing. On the other hand, other than embarking on generic approaches to finance challenges, the focus of contemporary studies for affordable housing finance have concentrated on finding sustainable as well as innovative financing schemes to replace the traditional funding systems. Literature shows that innovative financing successfully replace traditional financing systems in providing access to funding for low to medium income groups (McGaffin et al. 2019; Centre for Affordable Housing Finance in Africa Yearbook, 2017; World Bank Group, 2015). The combination of these two elements would provide the best solution to housing finance programs in Malawi (United Nations, 2015, 2019; World Bank Group, 2015; Jumbe, 2014) as has been the case in other continents. The purpose of this study was to identify gaps in literature on challenges and opportunities of urban high rise residential

housing finance in Sub-Saharan Africa for the first time under the perspectives of Malawi to inform the body of knowledge on the subject matter.

2.0. Methodology

The study used a desk study approach as per Patton (1990) to review literature on affordable housing finance for urban high-rise residential development in sub-Saharan Africa to identify gaps on the subject. The study particularly zeroed down on the themes of challenges of traditional finance and opportunities of innovative finance through the perspective of Malawi (Kothari, 2007). Peer-reviewed research work on the subject matter were studied to explore the housing issues and identify literary gaps in a bid to enhance contemporary discourse on housing finance in the continent (ibid; Williman, 2006).

CHALLENGES AND OPPORTUNITIES OF HOUSING FINANCE IN MALAWI ON URBAN HIGH-RISE RESIDENTIAL HOUSING, A LITERATURE REVIEW

2.1. Housing Issues and Challenges

Housing has been known to be multifaceted; having strong linkages with population growth, poverty, GDP, and urbanisation, among others (Bah et al. 2018). But while cities in the whole world are in what may be termed a housing crisis, countries in the global south are deeply soaked in the consequences with largely negative statistics on these variables (ibid; Carey and Tshangana, 2020). Considering such failures, questions have been raised as to whether institutionalised multilateral efforts – such as new urban agenda, sustainable development goals and universal declarations on human rights, have done enough to address the housing shortage in Africa as a universally declared human right or whether individualistic approach of tackling housing crisis is helping developing countries (Doling et al. 2013, 32; Carey and Tshangana, 2020; Bayer et al. 2019; Tripple, 2015; United Cities and Local Governments of Africa 2020). Also observed is the inelastic supply of land in response to huge demand for housing in rapidly populating countries with small land sizes such as Malawi, bringing into perspective a question of whether liberalised housing system is being challenged due to failure of property market to self-correct (World Bank Group, 2015; National Housing Policy, 2019; Carey and Tshangana, 2020b; Bah et al. 2018).

2.2. Limitations of Traditional Finance System

2.2.1. Challenges of Traditional Real Estate Financing

As explained earlier, the excelling worse off housing finance situation have spotlighted a need to deeply understand housing finance system and identify appropriate solutions to addressing the housing shortage (Awe, 2001; Jones and Stead, 2020; Kajimo-Shakantu and Evans, 2006; Limba, 2018; Pinglo, 2016). However, a recent study by Musvoto and Moya (2018) revealed that a lot of studies are not done systematically. A need to undertake

structural perspectives in housing studies was advocated.

Inquiries about why traditional financing system has failed to provide funding for affordable housing (Montgomery et al. 2018; Carey and Tshangana, 2020b) has revealed that it is due to risk mitigation practices. Following the global effects of 2008 financial credit crunch, banks started incorporating due diligence mechanisms as well as enacting new regulations such as Basel II and III to limit risk exposure and loan defaults (Shneor et al. 2020). The spectrum for risk averseness in developing countries tends to be wider due to economic fragilities there present (Centre for Affordable Housing Finance in Africa Yearbook, 2019; Kadale Consultants, 2009; Kajimo-Shakantu and Evans, 2006). Consequently, low to medium income earners as well as SME's and startup companies are largely excluded from the financial system (Shneor et al. 2020).

2.2.2. Extent of Exclusion – Case of Malawi

Malawi has sustained higher interest rates for over a decade and as of 2019, it was 4% higher than Southern African average of 16% (Carey and Tshangana, 2020a). This provides an excellent case study to understand how the cost of finance limit access to financing in the region. A look on the extent of exclusion in this paper is undertaken through the lens of commercial banks and micro finance institutions (MFIs) offering real estate related loans in Malawi.

Mortgage loans are offered by four commercial banks namely: Standard Bank, National Bank, First Discount House, and New Building Society. The standard loan term for a real estate loan includes 20% interest rate, 20 years loan repayment period, 10% equity contribution, and a minimum loan amount of $16,300 (conversion at a rate of $1 = MK 738 as of 31st March 2020, henceforth). under fluctuational interest rate regime as shown in table 1 below (Kadale Consultants, 2009; Carey and Tshangana, 2020b).

Using these standard rates, the minimum loan would require a monthly payment of $270. This means that a qualifying client must be receiving a salary of $772 a month. However, according to Carey and Tshangana (2020a) the average salary of loan applicants is $543 a month and this represents 70% of mortgage clients. In addition, houses for sale within the urban setting- a catchment area for commercial banks, are beyond the $16,300 margin thereby becoming another impediment to housing finance access. Put in other ways, low- and middle-income earners are forced to find land outside the city precincts thereby disqualifying from traditional finance mortgage access.

Table 1: Standard Mortgage Loan Conditions in Commercial Banks in Malawi

Loan Elements	In Dollars ($)
Minimum Loan Commercial Banks can offer	$16,300
Passing Interest Rate	19.50%
Repayment Period (in years)	20
Number of payments per annum	12
Derived monthly payment (from mortgage repayment calculation using the data given).	$270
If the $ 270 is the maximum amount that banks are legally authorised to deduct from borrower's monthly income (being 35% of monthly salary) for a $16,300 home loan	
Then the borrower's monthly salary must exceed	$772

Source: By Researcher with excerpts from Centre for Affordable Housing Finance Report, 2020

MFIs, on the other hand, are by their nature restrictive on loan size (a maximum of $2,710) and type of clientele (mostly low-income civil servants) (Carey and Tshangana, 2020b). MFIs in Malawi total to about 46 and are known to offer more flexible and competitive loans for home and land purchase as well as house construction in peri urban areas (ibid). The success of MFIs in Malawi centers on utilisation of employment to replace need for collateral where repayments are deducted from the source and the low margin loans (ibid). Though MFIs have been crowned as an innovative funding tool growing exponentially across Africa and the entire world the same is not able to support AUHRH as per the case of Malawi (Carey and Tshangana, 2020a). Also, since the enactment of MFI Act in Malawi in 2010, no micro housing company specialising in real estate has been established.

2.3. AUHRPH Issues in Malawi

2.3.1. The Affordability Question

An important aspect in the literature kickstarting AUHRPH issues have been about understanding affordability. The question of what the term 'affordable' means has been complex. Firstly, it has probed the kind of houses that should be considered affordable - that is whether single or high-rise (Adabre et al. 2020). Literature shows that definition of affordable housing skews towards single-storey basic detached houses (Carey and Tshangana, 2020a). Only a handful of studies have associated affordable housing to high-rise residential housing (Maleki et al. 2022; Tsui, 2021; Troy et al. 2020). Key questions have centered on whether affordable houses should incorporate sustainability features, recommended designs for the houses, and suitable location – that is in the urban precincts or in the outskirts (Borrero-Domínguez et al. 2020). Secondly, affordability has been considered in the perspective of the

recipients, as in, what qualifies one to become a beneficiary of affordable housing products, for how long they should be within that bracket and what is the limit to which government can contribute to providing subsidies for affordable housing (Vale et al. 2014).

2.3.2 High Rise Residential Property Developments and Supply of Land

Malawi for the first time, through the City of Lilongwe, introduced high-rise residential zones of up to eight storeys within the city boundaries to among other accommodate high rise residential property developments (Japan International Cooperation Agency Report, 2010; Lilongwe City Council, 2015; Lilongwe City Council and Japan International Cooperation Agency Report, 2014). These reports indicate that the City Council approved urban structure plan that that spans to 2030 to guide developments within the city. The plan covers a total of 1,155 hectares of urban land for new high rise residential zones in low and medium density areas namely: 3,9, 17, 26, 33, 37, 42 and 52. Of these allocated land parcels, many of them are already developed except for areas 17 and 52.

Literature supports locating the low- and medium-income earners within the CBD for its associated multiplier effects such as inclusive growth, and effective use of infrastructure, services, and resources in the economy (Jones and Stead, 2020; Doling et al. 2013; Tsui, 2021). However recent studies have confirmed early findings that without special intervention, real estate economic forces dictate otherwise (Musvoto, 2019). Also, financing gap remains a thorny issue as both traditional financing systems and microfinance are not able to address the affordable housing finance problem (Adabre et al. 2020). The literary study looked at legal, institutional, proprietary, operationalisation and economic issues at hand that may affect adoption of real estate crowdfunding as a solution to financing problem.

2.3.3 Laws and Policies

The constitution of Malawi does not explicitly mention about housing, but it does so indirectly through section 28 which gives right of ownership of property and restricts arbitrary deprivation. Housing policies in the country namely, National Housing Policy (NHP), Malawi Growth and Development Strategy (MGDs) III, and the recently adopted Malawi Vision 2063 are inspired by same spirit in the law. However, both documents do not address the route of providing affordable urban high-rise property developments.

Of the three documents, NHP is the one that provides broader intervention in housing. NHP, as approved by Malawi government in 2019, prioritises the low income and vulnerable groups by among others entitling them to 50% of serviced plots the country will be developing on annual basis (National Housing Policy, 2019). On the other hand, the policy embraces the ideologies of liberalised housing market economy and confirms the governments' role of creating an enabling environment to support capitalists housing practices in the country. However as explained above, the low-income earners do not have access to financing in Malawi as such there are higher chances that the plots would not be developed especially if located in the urban areas due to high costs of development. NHP also

indicates the government's commitment to be building 200 incremental houses a year for middle income earners (ibid).

2.4. Opportunities of Alternative or Innovative Real Estate Financing Options

Alternative or innovative financing offer more competitive options on real estate than traditional financing (Ziegler et al. 2020). Key innovative financing for housing or real estate has been identified as MFI's and crowdfunding.

2.4.1. Micro Finance Institutions

Literature shows that micro finance institutions (MFIs) are more innovative and flexible than traditional banks (Montgomery et al. 2018; Banerjee et al. 2015). However, a recent study by Montgomery 2018 shows that restrictions limiting MFIs growth. Pinglo (2016) in his study about sophomores in Mexico showed that removing impediments make MFIs the best housing financing option over commercial banks. This study showed that sophomores were able to introduce the quality of flexible loan payments, larger clientele base, low interest rates, and specialised focus on real estate loans. In Africa MFI's have also experienced growth taking the same fashion as elsewhere in the world. However, as Wood (2019a) noted there isn't much literature within the sub-Saharan region pertaining to loan size and its contribution in the housing sector.

2.4.2. Crowdfunding

Crowdfunding is a very well-known phenomenon worldwide having originated from the European countries. Over the years, crowdfunding has earned the title as a best low-cost source of financing for various purposes such as donations, community causes, disaster response, and any other fund-raising activities (World Bank Group, 2015). Africa has snail-paced its adoption of crowdfunding but the same has been a blessing in disguise as the continent employs tried and tested models initiated elsewhere in the world (Info dev report, 2013). Montgomery et al, (2018) study reinforced this position by finding out that other positive factors such as increase in middle class population, rapid internet penetration, and the fallout of traditional financing system are the factors supporting such success.

Several recent studies have also found that Crowdfunding holds 76% market share of diaspora remittances to Africa (Ziegler et al. 2020) thereby proving to be a potential source for real estate crowdfunding and diversified investment product widening Africa's economic base (infoDev, 2013). The World Bank Group (2015) report showed that in 2010 about $20 billion was sent to sub-Saharan Africa through crowdfunding.

2.5. Real Estate Crowdfunding Defined

Real Estate Crowdfunding (REC) can be simply defined as an equity-based way of raising funds from the crowd, that is, a group of people anywhere using advanced technology tools (Shneor et al. 2020; Jenik et al. 2017; Montgomery et al. 2018). Schweizer and Zhou (2016) defined

REC more closely as:

"A form of financing in which real estate project developers make an open call on the internet (typically through specialised platforms) to sell a specified amount of equity- or bond-like shares in a company or project, with the aim of attracting a large group of (primarily accredited) investors."

Unlike other models of crowdfunding, REC is particularly designed to finance real estate (Ziegler et al. 2020; Jenik et al. 2017). Consequently, REC qualifies to be a viable source of funding for money intensive high-rise residential property developments.

2.6. Success of REC as a means of financing AUHRPH

Success of REC has been registered in Europe. For instance, in 2016 it outpaced other crowdfunding typologies with a leading margin of more than 33% to that of a runner-up (Shneor et al. 2020). For the preceding years up to 2018 REC had been in a tight race with the debt-based crowdfunding both in Europe and globally. The success of REC in Africa was registered in Zimbabwe with the trading volume of $0.7 million in 2018 (Ziegler et al. 2020; Shneor et al. 2020).

Over the recent years, REC has gained traction as one of the progressive innovative financing systems disrupting the traditional finance practices for real estate (Kirby and Worner, 2014; Mian, 2016; infoDev, 2013) though few early studies found this not to be the case (Latorre, 2016; Tang, 2011; Bogdanova, 2018). Also, other most recent innovative financing solutions appear to be two advanced for most of the economies in the sub-Saharan region such as special purpose real estate investment trust (Onyekwelu, Anil, and Nwaibe, 2020), live public platform trading (Palladino, 2019), and hybrid MFI-based solutions (Jones and Stead, 2020).

Particular to REC, a groundbreaking study by Borrero-Domínguez et al. (2020) on identifying success factors for REC found that loans for build to rent are more stainable than build to sell because of time-on-the-market costs. A related study was done by Gibilaro and Mattarocci (2019) which compared crowdfunding real estate investment trusts (REITs) vs equity REITs in terms of the performance in a portfolio setting. The results showed that crowdfunding REITs outclass equity REITs.

Studies within the southern African region have only looked at crowdfunding in general and not REC (Michoud and Hafner, 2021). In a study titled and empirical analysis on crowdfunding in sub saharan Africa, Hiller (2017, 140) found that Malawi is below the average global crowdfunding rank due to institutional and infrastructure impediments. There is no literature in Malawi either on REC or crowdfunding in general. The dearth of literature is also on the topic of affordable housing finance as well as innovative finance as latter-day studies have focused on other issues such as participatory planning (Refstie and Millstein, 2019), village banking (Maganga, 2020), and financial inclusion (Chipeta and Kanyumbu, 2015; Owolade and Borgstein, 2019; Nkuna et al. 2018). Recent statistics on general housing situation in

Malawi is provided through reports by multi-national organisations namely Center for Affordable Housing Finance and UN-Habitat.

2.6.1. Benefits of REC

The benefits of REC include provision of cheap and easy source of financing to all types of businesses; higher levels of effectiveness, transparency, efficiency; provision of a diversified and high yielding investment option to investors; involvement of investors in decision making of the company; and provision of access to global markets and investors (Montgomery et al. 2018; infoDev, 2013; Jenik et al. 2017).

2.6.2. Risks of REC

Literature has shown that REC is equally risky as other secondary market and digital or tokenised products. The list of risks includes campaign fraud, high default rates, cyber-security breach, change in regulation, illiquidity, due diligence impediments, and investment failure due to high levels of malpractice (Infodev, 2013; Claessens et al. 2018; Kirby and Worner; 2014; Montgomery et al. 2018). For instance, Jenik et al. (2017) in a defining trend study about crowdfunding in United Kingdom betweeen 2011 and 2013 found that 94% of fundraisers reported negative accounts.

2.7. Success of Crowdfunding in Southern Africa

It has been pointed out earlier that REC has not been studied in the southern African region. However, there is a record number of studies that have reported successes of crowdfunding in general as used for various purposes such as donations, community support, startup funding and many others (Michoud and Hafner, 2021, 92; Fsdafrica, 2016, 28; Hiller 2017, 87). Michoud and Hafner (2021) in their groundbreaking work in a book titled “financing clean energy access in sub saharan Africa risk mitigation strategies and innovative financing structures” reported that southern African follows the rest of the world in successfully rolling out crowdfunding programs. According to these findings, more than 70% of the crowdfunding platforms operating as of 2021 were foreign-based.

3.0. Results And Discussions - Knowledge Gap

The review of the literature in showing the knowledge gap as per the scope of the study clearly confirms that finance is the crux of affordable housing supply challenges in the region as exemplified by Malawi's scenario. The analysis of lack of access to finance for low and middle income earners showed the extent of exclusion under the current traditional finance systems. The key gap identified in the study is that the country's financing systems cannot finance AUHRH. On the other hand, REC as a solution to AUHRH finance problems has the

potential to address the challenges if implemented (Awe, 2001). Secondly, while state organs have shown to be the epitome of an economy in the region able to provide land for HRPDs within the city prencincts for low and middle income dwellers, there is no study / findings to assess the success of such initiatives (Jones and Stead, 2020). Finally, there is no study to assess if MFI's - the now leading and more flexible source of housing finance for low income earners - can be graduated to address AUHRH financing problem and increase threshold to middle income earners as a complement to REC.

The literary undertaking was limited in scope by focusing on a AUHRH literature and did not include social and in inclusionary housing. There is a wide range of literary work in this subject especially in South Africa that could help to provide deeper meaning on the subject understudy. It is therefore recommended that similar assignments expand their scope to include these types of housing. However, caution would need to be taken in this wise as the provision of these type of housing are context or policy based in relation to individual country's characteristics.

4.0. Conclusion

The purpose of this study was to enrich the ongoing discussions on how innovative financing can be a panacea to housing crisis in Africa by distinctly looking at urban high-rise residential housing, as a first case scenario for the African region. The literary study has analytically shown that without adoption of innovative funding, affordable housing as a most universally agreed upon human right might not be delivered in suitable locations and needed quantities in sub-Saharan Africa as evidenced by Malawi's situation. While traditional finance systems have proved exclusionary, the increase in housing demand fueled by rapid population growth has not only challenged the liberalised housing approach but also probed for a revisit of affordable housing policies. In the light of the circumstances, REC and MFI need to be explored in the context of local environments in respect of sub-Saharan Africa countries to identify implementation models, impediments, and opportunities.

Particularly, future studies would focus on crowdfunding regulation, REC viability in comparison with MFIs, AUHRH implementation and stakeholder effectiveness, and determination of critical mass for investor participation in REC operationalisation.

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MARKET DATA LIMITATIONS IN THE APPLICATION OF INCOME APPROACH TO PROPERTY VALUATIONS IN NIGERIA: PRACTITIONERS' PERSPECTIVES

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Abstract

Whereas the income approach (investment method) to valuation represents the most applicable method of valuing income generating properties, limitations arising from the dearth of market data for market comparisons and determination of yields, among others, sometimes question the reliability of most opinion of values. Meanwhile, valuation reliability is a worldwide issue in the property industry. With the emerging trends of hedonic pricing, big data analytics, growth-explicit valuation methods, and cross-country investment comparisons (for FDIs), dependable and readily available sources of researched data are indispensable, and the African real estate market cannot be left behind.

Drawing on the authors' practical experience in property valuations over the years, this paper sheds light on the prevailing means and ways of data sourcing and usage by which the menace of lack of data for property valuations is being overcome. The paper recommends measures such as company/individual practitioner's data collection and processing, vetting and peer-reviewing of procedures, having institutional property databank, as well as the development of country-wide and continent-wide property databanks as ways to aid cross-country investment property appraisals.

Keywords: Property, Market Data, Market Information, Income Approach, Valuation

1.0. Introduction

The importance of valuation as a tool for effective decision making can place it as a major requirement for economic growth. No investor will rationally go into any investment unless and/or until he or she is guaranteed of periodic future returns or lump-sum profitability. Even government would be interested in the benefits of an intended project before committing state resources into such. In all, there is the need for an aid to assist in taking viable investment decision. Thus, the need for valuation, which can be a financial forecast of the expected and total benefits in respect of interest in a real estate asset, becomes inevitable (Blackledge, 2009, pp. 6,24; Ogunba, 2015, p. 4).

Efficient valuation requires data. If valuation will serve its purpose, the process, the methodologies and the eventual valuation opinion must reflect the realities of the market. It is expected that the valuer takes congnisance of, and incorporate relevant data as input for accurate prediction of the behaviour of the market. As such, the importance of the availability, adequacy and relevance of data for valuation assignments cannot be over emphasized. Several authors have attested to this particular criticality of dependable property market information for effective valuations in Africa (Ashaolu and Olaniran, 2016; Ayedun, Durodola, Ajibola, and Oloke, 2014; Baffour-Awuah, Gyamfi-Yeboah, Proverbs, and Lamond, 2017; Nnamdi and Emeka, 2020; Onwuanyi, 2020).

However, with the relatively less-than-transparent nature of many African property markets like Nigeria (Clement, Ogunba, and Dugeri, 2016; Thontteh, 2013; Dugeri, 2011), it has been established that obtaining and accessing dependable real estate data for valuations is a difficult undertaking. The problem of lack of data for valuations has been the focus of many of the available studies in that regard (Ashaolu and Olaniran, 2016; Baffour-Awuah, et al., 2017; Mahama and Antwi, 2006; Onwuanyi, 2020). The results from extant studies have documented valuation inaccuracies as a result of the lack of access to relevant data (Abidoye and Chan, 2018; Ajibola, 2010; Ayedun et al., 2012). Others have documented several degrees of valuation unreliabilities occasioned by the paucity of reliable valuation information (Ayedun, 2009; Ogunba and Ojo, 2007; Ojo, 2004). Yet valuers in active practice undertake and execute valuation assignments on a daily basis.

Valuations become herculean tasks with the paucity of robust and reliable market information. However, it is quite clear that the valuation industry is growing and becoming larger by the day despite the lack of accesses to data repositories by many a valuer in Nigeria. Then, the question is: how do the Nigerian estate surveyors and valuers overcome the

problem of market information to undertake valuations and present acceptable valuation opinions of values? Another question is: how do the valuers assess the data they use for their valuation exercises and get over reliability issues? This study will draw on the authors' experiences to answer these questions and present a status quo on the subject matter while making recommendations for the improvement of property market situations with respect to valuation data.

2.0. Literature Review

Available studies have severally evaluated the importance and challenges of data accessibility in the African property markets, especially in Nigeria and Ghana. Examples include Baffour-Awuah, et al., 2017; Ashaolu and Olaniran, 2016; Mends, 2006; Onwuanyi, 2020; Ajibola and Ogungbemi (2011). The general recommendations from their findings have considerable significance for the improvement of the practice of property valuation. However, with the consensus of the previous studies that there is the problem of lack of robust property market data available to the practitioners, there calls for the need to understand the approach adopted by the practitioners to overcome this imbroglio; hence, this study.

The study of Ajibola and Ogungbemi (2011) examined the determinants of data accessibility for accurate and reliable valuation delivery in Lagos State, Nigeria. With focus on 190 practising Estate Surveyors and Valuers, the study collected data with the aid of questionnaire survey. The study found that in-house databases, in-house valuers, other local valuers, personal experience, and the use of property press were major sources through which Nigerian valuers obtain data for valuation exercise. The study recommended the need for the establishment of a regularly updated property databank to which valuers can have unhindered access even if it involves paying a token.

Ayedun et al. (2014) examined the causes of valuation inconsistencies in Metropolian Lagos, Nigeria. The study employed quasi-experimental method to reconcile the valuation opinion of forty-five estate surveyors and valuers with recently sold sales price of twelve residential properties within Lagos Metropolis. The findings demonstrated that the lack of uniformity in the selection of adopted valuation inputs as well as faulty data selection were the causes of the significant variation in valuation outputs among the valuers. The study noted that most of the surveyors lacked the requisite training and knowledge as to ways of choosing and working with available data for effective valuations.

Ayedun et al. (2012) undertook an empirical investigation of the factors responsible for

valuation variance and accuracy in Nigeria. The study undertook questionnaire survey supplemented with interviews of estate surveyors and valuers in practice and academia who are based in Lagos, Nigeria. The results showed that different factors, including a shortage of market data and inadequate training and experiential knowledge on the side of the valuers, contributed to valuation inaccuracy and variance. The study surmised by urging the creation of a suitable property databank and the implementation of valuation standards by the regulatory and administrative bodies of the professionals, the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) and the Nigerian Institution of Estate Surveyors and Valuers (NIESV) respectively.

Adewusi and Patunola-Ajayi (2021) examined inhibitions to the adoption of Artificial Intelligence (AI) for property valuations in Lagos, Nigeria. The study collected data with the aid of questionnaire administered on one hundred and ninety-four (194) firms of Estate Surveying and Valuation in the study area. Gathered data were analysed using descriptive statistics. Sequentially, the study found the major constraints to the adoption of AI in property valuations to include: lack of centralized property market data; inadequate level of awareness of the application of Machine Learning Algorithm valuation methods; dearth of market data and comparables; insufficient technical know-how, and deficient skills and learning processes.

The work of Nnamdi and Emeka (2020) examined reasons why valuers do not make use of annuity-due in conventional investment method of property valuation. With questionnaire survey backed up with interviews administered on ninety-eight (98) registered firms of Estate Surveyors and Valuers domiciled in Aba, Enugu. Onitsha, and Owerri towns, primary data on factors that could be responsible were collected. The study found factors such as lack of systematic procedure to determine valuation inputs and the challenge of lack of up-to-date property databank, that would help valuers determine valuation inputs, as reasons for the non-adoption.

In a review of the property data challenge in Nigeria, Onwuanyi (2020) identified a major consensus in the literature about the gap in data as a challenge for the Nigerian property valuers. The study also noted, from an extensive literature review, that because of poor accessibility to data, Nigerian valuers adopt coping mechanisms rather than best practices in the application of available data for property valuations. The author also found a convergence of views in the literature as to the importance of establishing central data bank for effective and more accurate valuation exercise.

Ibisola, Folarin and Atilola (2018) examined the possible challenges in the valuation of art and

artifacts. The results of empirical data obtained through questionnaire administration on seventeen Estate Surveying and Valuation firms in Abeokuta, Ogun State, Nigeria, and the descriptive analysis of data, showed that effective and reliable valuation undertakings are hampered. The study found the reasons to be largely due to insufficient information and inaccessibility to past transaction records. Moreover, many of the young estate surveyors did not have sufficient training and experience to handle the valuation of art and artifacts.

In two Nigerian cities, Ashaolu and Olaniran (2016) looked at valuers' options for overcoming the lack of market data. The study's inferential analysis of data obtained from administered questionnaire survey found that, accessing rental value and comparable sales price were the easiest, while obtaining property yields and suitable rates for depreciation were the most difficult. Considering the challenges in gaining access to data, it was discovered that valuers in the study area either turn to their colleagues, implement another applicable technique, or apply a variety of data-scooping assessments in executing valuation assignments. Additionally, the study submitted that, years of experience, designation at the firm, and professional status all have significant impacts on preferences for data sources. The paper recommends further study into the perception and determination of yields among Nigerian valuers; the institution of a centrally managed databank valuation inputs as well as a condition to preserve documentation of valuation calculations and data used to prove the rationality of unusual valuations.

Baffour-Awuah, et al. (2017) studied the measures taken by property valuers in Accra, Ghana to deal with the difficulties associated with the lack of dependable property market data by using a mixed-methods research methodology that included a stakeholder workshop, systematic review of the literature, and questionnaire survey. The research revealed seven sources of real estate market data that valuers utilize to get information for their valuation assignments. These include valuer's individual database, public institutions, the media, professional colleagues, property owners, estate developers, and estate agents. Besides, the study reported that, the dearth of credible market data for valuations was caused by incomplete and dispersed data, which was frequently the result of administrative shortcomings; the withholding of transactional information due to confidentiality agreements and the desire to evade taxation; data integrity issues; and an absence of sufficient training and experience, particularly for estate agents to gather and maintain market data. The authors recommended that practitioners exhibit sense of duty , attentiveness, and a set of information gathering skills, implying that valuers should participate in regular, appropriate training to advance their expertise and competences. The

study concluded by aligning with extant studies to make further calls for the creation of a real estate market databank to aid the professional delivery of more rational and accurate valuations.

The perspective of estate surveyors and valuers on the establishment of a centrally managed property database was explored by Olapade, Ekemode, and Olaleye (2019) with a view toward the conception and operation of this type of database - of completed property transactions. One hundred and ninety Estate Surveying and Valuation companies in Lagos, Nigeria's real estate industry were surveyed. For data analysis, descriptive statistical methods were used. Findings of the study indicated that the valuers favoured an institutional databank that will be accessible online and offered free access to its contents to anyone who submitted their market data. They also desired a unified recording standard in the database, a user-friendly portal, and a secure interface to restrict access by intruders.

3.0. Research Methods

The study adopts the case study approach, drawing on the authors' personal experiences in practice. It provides a qualitative approach and contextual data on market data sourcing and utilisation in the Nigerian property market. According to Bell (2005), a case study of this nature is a useful method to carry out a research that requires in-depth understanding of the manner of providing solution to peculiar problem. McNiff (1992) cited by Oladokun (2011), argued that this type of study will provide results that are accurate and dependable and representative of the case studied. It is thus an explanatory endeavour of the data accessing methods adopted by the Nigerian estate surveyors and valuers.

4.0 Practitioners' Means and Approach to Available Data

This section details the approaches adopted by practitioners to handle the issue of unavailability of data application for income approach to property valuations. After establishing the purpose of valuation, the valuer proceeds to deduce the basis (or bases) of valuation, conducts physical inspection of the subject property, and obtains other property specific and market centred information. Thereafter, gathered data are subjected to any of the variants of income approach to property valuation.

The income approach to property valuation basically involves four steps (in the valuation of a lessor's interest). These steps include:

1. Rent determination

2. Determination of outgoings

3. Determination of yields, growth rates and discount rates

4.0. Application of The Model(s) of Income Approach

The above steps agree with the position of published property valuation texts including Ogunba (2013, p. 94-99); Shapiro, et al. (2013, p. 12-13), and Blackledge (2009, p. 197). Valuations may consist of a number of components, each necessitating a distinct comparable (Shapiro, et al., 2013, p. 12).

1. Rent determination:

This involves collection of information on annual rent passing on the subject property and determination of the full rental value from market evidence. Data problems arise here because landlords may give falsified or inflated information about the rent passing on their properties to bias the valuation in their favour. Authors such as Levy and Schuck (1999; 2005) reported that, clients may withhold unfavourable details and give selective information to valuers in order to influence property valuation. Moreover, there is usually no published information on actual rent passing or rental values of properties in Nigeria.

To surmount the challenges of falsified information and lack of published information on property market rents, the authors adopt some validity checks. Information on rent that are supplied by landlords or their representatives and market rental values are established by consulting professional colleagues and local agents who practice in the immediate neighbourhood or near-by locality to the subject property. More so, the information is further confirmed by checking property listing sites (online) for information on similar properties available for rent.

The IVSC (2019) and the NIESV (2017) support the above procedure. According to IVSC (2019), valuers must take into account the contract rent and, in circumstances where it is dissimilar, the market rent, when assessing either a higher interest that is pursuant to a lease or an interest derived by a lease (see para. 40.2 of IVS 104 - Bases of Value and para. 100.2 of IVS 400 - Real Property Interests). IVSC (2019) further states that, specifically, market rent does not include a rent that has been inflated or deflated due to unique conditions, factors, or concessions. The suitable lease terms are those that would ordinarily be decided upon by

market participants for the sort of subject property as at the date of valuation (see paras. 40.3 & 40.6 of IVS 104 - Bases of Value).

NIESV (2017) states that, it is anticipated that the client would supply any factual information, particularly details regarding transactions involving the asset, liability, or property that are pertinent to the valuation assignment. The individual property valuers are expected to gather, validate, and analyze relevant sales data, economic factors, as well as associated evidence that supports reasonable value judgments. Moreover, the NIESV (2017) stipulates that valuers must constantly evaluate the validity of data utilised in supporting valuation analyses (see para. 3.2.4(k) of Section 3.0 - Nigerian Professional Standards (NPS); and paras. 4.1-4.2 of NVPGA 7 - Valuation of Personal Property, Including Arts and Antiques).

2. Determination of outgoings:

Annual running costs of properties, otherwise referred to as outgoings, including cost of management, maintenance, repairs, neighbourhood development levies, land use charges, and the likes, are necessary for arriving at the Net Rents of properties for valuations. This data is usually supplied by the clients (landlords) or their property management agents. Again, this information may be subject to clients' bias to give the notion of high rent generation by the property with minimal running costs. Moreover, there are no publicly recognised reports, newsletters or publications about outgoings for categories of properties on Nigeria.

What we do is to benchmark these client-supplied details with current information about market situation in that regard, which are obtained from property management unit of the firm and from professional colleagues. At other times, heuristics and knowledge of local market sentiments may prevail in determining reasonable outgoings for specific properties. For instance, there is a believe among certain property managers and valuers in Nigeria that no property owner will agree to spend more than 10-20% annually on routine property management, maintenance and repairs (expect for occasional capital expenditures on unplanned, corrective maintenance).

The above procedure is in line with guidelines indicated in NIESV (2017). The NIESV (2017) notes that, whereas for specific purposes, exceptional provisions may need to be specified, the suitable lease terms will often match established practice in the market where the subject property is located. The tenure of the lease, how frequently the rent is reviewed, and who is responsible for what expenses like repairs and other outgoings will all have an effect on the rent to be capitalized (see para. 1.3.3 of NVPS 4 - Bases of Value, Assumptions and Special Assumptions). The NIESV (2017) stipulates further that information on significant outgoings

and operating expenditures must be obtained; however, if somehow the valuer is unable to examine the lease or because the scope of modifications or renovations cannot be verified owing to the unavailability of formal approvals, the valuer should proceed based on specified assumptions (see para. 8(a) and 8(d) of NVPS 2 - Inspections and Investigations). The IVSC (2017) states that traditional bases of value disallow taking into account data or market sentiments that subject market participants could not reasonably be expected to know on the valuation date (see para. 10.5 of IVS 104 - Bases of Value).

3. Determination of yields and growth rates:

Depending on the model of income approach of valuation to be adopted, this stage involves the determination of applicable yields such as all-risk yield (ARY), equated yield, investment yield, exit yield, etc. Usually, necessary working information needed in determining the yields and rental growth rates would include market rental values, capital values, yield on gilts, lending/borrowing rates, and inflation rates. Then again, there are no categorical, periodic publications of data on property yields in Nigeria. Paucity of reliable market data also hampers the best rational process that we could adopt in the determination of the yields especially for comparison purposes.

We source data for yield on gilts, commercial banks' lending rates and inflation rates from the periodic publications of the Central Bank of Nigeria (CBN)[1]. In determining capitalization rates, information on market rental values and capital values are sourced from professional colleagues (and their property listings) and from local real estate agents regarding recent transactions. We also adopt heuristic adjustment of details derived from property listings online (such as nigeriapropertycentre.com[2], propertypro.ng[3], privateproperty.com.ng[4], etc.).

The above practice is in line with the IVSC (2019) and the NIESV (2017). The IVSC (2019) states that, realtor quotations, mainstream pricing sources, the prices of similar products from third parties, and market information pricing facilities are just a few of the sources from which valuation data may be derived (see para. 90.2 of IVS 500 - Financial Instruments). Furthermore, the IVS advises that data on comparable transactions should come from a reputable and trustworthy source and that transactions which take place more recently compared to the valuation date are more indicative of the market at that time than older market details, especially in volatile markets (see paras. 30.7(c) and 30.7(f) of IVS 105 - Valuation Approaches and Methods). Additionally, the normal "risk-free" return might be amended for the increased risks and prospects unique to the specific real estate investment in order to establish a suitable discount rate (see para. 60.6 of IVS 400 - Real Property Interests).

1. The applicable periodic publications of the CBN can be found at:

https://www.cbn.gov.ng/rates/mnymktind.asp

https://www.cbn.gov.ng/rates/inflrates.asp

https://www.cbn.gov.ng/Documents/depositandlending.asp

2. See https://nigeriapropertycentre.com/for-rent/flats-apartments/showtype

3. See https://www.propertypro.ng/property-for-sale

4. See https://www.privateproperty.com.ng/

NIESV (2017) states that the market comparison approach compares previous sales and market offers of comparable properties as well as relevant market data to determine a subject asset's value (see para. 6.3 of NVPGA 6 - Valuation of Intangible Assets). Furthermore, the NIESV (2017) guideline states that, depending on availability, involving market players and informants who can offer insights about market transactions and dynamics is crucial for the appropriate use of material data in valuation analysis (see para. 5.3.7.4 of NVPGA 3 - Valuation of businesses and business interests).

4. Application of the investment method(s):

After property specific indices and open market data have been gathered, appropriate models of the income approach to valuation are then applied. We normally adopt three variants of the income capitalization method (one is the common Term and Reversion, the other involves adopting an exit yield on the unexpired term of years in the Certificate of Occupancy and the third is the capitalization to perpetuity for owner-occupied property). We also adopt a variant of the Discounted Cash Flow Analysis (DCF) (which is an adjusted version of the NPV) to determine the Investment Value of subject income producing properties.

On the use of income capitalization, Igboko (1992) reported to the body of valuers in Nigeria that, if appropriately sourced and reliably determined yield is used, the investment method (using Y.P.) should give a sufficient indicator of value. Klamer et al. (2018) submited that, some valuers still choose income capitalisation method instead of the DCF models for property valuations in the Netherlands. The IVSC (2019) presents that, instead of the cost of replacement and its ability to generate income, the price a property would command in the open market is the most crucial factor determining its value (see para. 20.3(e) of IVS 105 - Valuation Approaches and Methods). The NIESV (2017) guideline suggests that although the income approach may involve a model of discounted cash flow (DCF) analysis and that this assessment is established by consideration of both historic economic performance and

future projections, the single period capitalisation technique may be used if detailed and reliable data for DCF are not accessible (see para. 5.3.9.1 of NVPGA 3 - Valuation of Businesses and Business Interests).

On our use of DCF to determine Investment Value, the NIESV (2017) stipulates further that, value parameters are created by discounting anticipated cash flows to their net present value at a certain rate of return, with growth and inflation estimates included as necessary. The rate of return includes the risk-free rate for using the money, the anticipated inflation rate as well as market and investment-specific risks (see para. 5.3.9.6 of NVPGA 3 - Valuation of Businesses and Business Interests). According to the IVSC (2019), the threshold of interest rates, participants' expectations for returns on comparable investments, and the risks associated with the projected income stream are all to be taken into account while determining the right discount rate in a DCF variant of the income approach to valuations (see para. 60.5 of IVS 200 - Businesses and Business Interests).

Moreover, for every property valuation assignment (income producing properties), we do compute values (Fair Market Value and Forced Sale Value) based on the three valuation approaches - cost, income and market comparison methods - as a form of triangulation and corroboration. The resulting values are presented in a table as part of the valuation report. As a matter of fact, this has become the norm in the requirements from a number of commercial banks in Nigeria that requires property collateral for loans.

Justification for adopting the three valuation approaches is that, the IVSC (2019) holds that, not every conceivable valuation scenario would require a singular approach. The choice of valuation method must, at the least, take into account the accessibility of credible data required to use particular technique(s). The onus is on the valuer to select the best applicable method(s) for every valuation assignment. As a circumstantial consequence, the valuer may even employ a method not indicated or specified in the IVS in order to comply with the good intents of the IVS (see paras. 10.3(d) and 10.5 of IVS 105 - Valuation Approaches and Methods). Furthermore, the IVSC (2019) advise that, even when there is proof of market transaction pricing or an identified revenue stream to warrant the use of market comparison and income approach respectively, the cost approach may occasionally be utilized as a supplementary or corroborating technique for property valuations (see para. 10.4 of IVS 105 - Valuation Approaches and Methods and para. 70.4 of IVS 400 - Real Property Interests).

Nonetheless every information, reasonable assumptions, and adjustments made on available valuation data, draft and final valuation reports are always subjected to in-house peer-reviews and critiques, vetting and quality assurance assessment of the most senior

valuer and/or the principal partner of the firm. Kummerow (2003) observed the indispensable part played by years of experience of a senior valuer in taking uncommon stance on property's future value, which turned out to be the best decision at a critical time. The NIESV (2017) holds that, whenever available, it is advised to involve market participants who can offer critical perspectives about transactions and market dynamics that are essential for optimal use of gathered market data for valuation analysis (see para. 5.3.7.4 of NVPGA 3 - Valuation of Businesses and Business Interests).

Sometimes, after submission of the valuation report to clients or collateral-backed-lending institutions, our claims are debated and the data variables used in the income approach to property valuations are questioned. For this reason, for every valuation, we endeavour to keep details about every data input, field works, and computations in the office file for each valuation assignment for proofs and verifications. This aligns with the recommendation of Ashaolu and Olaniran (2016) that valuers should endeavour to preserve documentation of valuation calculations and data used, to prove the rationality of unusual valuations.

NIESV (2017) states that, the approach a valuer might use is not mandated by the standards. However, the valuer must be ready to articulate the justification behind the chosen method of valuation (see para. 5.1.6 of NVPGA 7 - Valuation of Personal Property, Including Arts and Antiques). According to the IVSC (2019), the most applicable and suitable valuation method(s) must be adopted based on the information available and the market conditions affecting the property being appraised (see para. 30.6 of IVS 104 - Bases of Value). NIESV (2017) further posits that, the valuer should be as clear and transparent as possible to show how much of valuation judgments are based on subjective assessments in markets where there is a limited volume of data to substantiate valuations empirically (see para. 2.5 of NVPGA 9 - Valuation in Markets Susceptible to Change: Certainty and Uncertainty**)**.

5.0. Study Limitations

In this case study, we have attempted to present the limitations arising from lack of robust, verifiable market data and how practitioners go about conducting the property valuations in Nigeria. The authors would like to state categorically that we do not claim that the models of income approach that we adopt is what all (or majority) of valuers adopt in practice in Nigeria. More so, we do not claim that other variants of the income approach cannot be adopted in valuation of real properties in the environment of paucity of reliable market data.

6.0. Conclusion and Recommendation

The good intents of valuation standards and guidelines are clear. What the IVS and the Nigerian "Green Book" emphasise is clear expressions and disclosures that depict transparency - of general assumptions, special assumptions, rationale for methods, constraints and other determining factors.

"Nemo dat quod non habet!" The increasing calls from the academic community for more rational, accurate, reliable and consistent valuations by practitioners may largely depend on the creation of institutional property databank(s); whereby valuers can have common source of credible valuation inputs.

This case study provides insight into the methods that valuers in Nigeria are using to address the issue of dearth of transparent and easily verifiable data for real estate valuations. This paper suggests steps, which includes company/individual practitioner's information gathering and storage, due diligence and peer-reviewing of methodologies, establishment of institutional property databanks as well as the creation of national and continental property databanks in order to facilitate trans-national property investment appraisals.

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ENHANCING ACCURACY AND CONSISTENCY IN THE VALUATION OF PLANT AND EQUIPMENT THROUGH CUBIC REGRESSION MODELS OF PHYSICAL DETERIORATION

Osasumwen EDIONWE

Abstract

The valuation of plant and equipment often involves valuers deducting physical, functional and economic depreciation from replacement cost estimates. These calculations have faced accuracy and consistency problems in the aspect of determining how much physical deterioration should be deducted. This study attempted to develop cubic regression models to resolve these accuracy and consistency problems in one industrial sector (the basic metal, iron and steel and fabricated metal product sectors) in the two main industrial cities of the western industrial zone of Nigeria (Sango Ota and Agbara). Questionnaire surveys were administered on senior operators of plant and equipment in these sectors to draw information on the degree of physical deterioration of plant and equipment over service life, using expenditure on repairs as a proxy for physical deterioration. The questionnaire sought information on the service lives of plant and equipment, the movement of transition of physical depreciation over the service lives, and the degree to which the movement of transition is influenced by various operational factors. Data were analysed using means, standard deviations, multiple linear regressions and cubic regressions, to produce what could be the first potentially accurate and consistent valuation model of physical deterioration in Africa. The service lives of various plant and equipment in selected sectors were found to range at various time points between 8 to 60 years. Cubic regression analyses showed that the pattern of the movement of transitions of expenditure on repairs (proxy for physical deterioration) over useful life of plant and equipment were not linear but cubic, and generally followed S-shaped patterns. Multiple regression analyses showed that the S-shaped patterns were in turn influenced by operational factors (such as intensity of use and power outages). The study concluded that valuers' interests in accuracy and consistency in plant and equipment valuation were not served by any of the accounting methods hitherto used by valuers; accuracy in physical deterioration modelling follows an S-shaped transition over

time. This S shape is exuberated where there is inappropriate operational use of the plant and equipment.

Keywords: Plant and equipment, physical deterioration, service lives, pattern of physical deterioration

1.0. Introduction

The professional services of an Estate Surveyor and Valuer are often required to determine the value of Plant and Equipment (P & E) assets. Theoretically, in carrying out this valuation task, the five valuation methods (the comparison, investment, replacement cost, profits and residual methods) can be adopted. However, P & M assets are often specialised assets. Specialised assets are 'property that are rarely, if ever, sold in the market, except by way of sale of the business or entity of which it is part, due to the uniqueness arising from its specialized nature and design, its configuration, size, location, or otherwise' (Royal Institute of Chartered Surveyors, 2005; Plimmer & Sayce, 2006). The specialised nature of P & M assets implies that the method of valuation almost invariably used is depreciated replacement cost. (International Valuation Standards, 2017). Depreciated Replacement Cost (DRC) is 'the current cost of reproduction or replacement of an asset less deductions for physical deterioration and all relevant forms of obsolescence and optimization' (Ogunba, 2013)

Depreciation from the view point of valuation standards means a loss of value in a property/asset due to three types of deterioration: physical deterioration, economic obsolescence and functional obsolescence. Physical deterioration is a situation where an asset (building, plant and equipment) suffers a reduction in value due to age, wear and tear. Functional obsolescence in P & M valuation is a loss in value of assets caused by advances in technology that result in new P & M assets that are cheaper and more efficient than the asset being valued. Economic obsolescence is loss in value of an asset resulting from changed economic conditions which reduce the capacity utilization of the asset being valued (Ogunba, 2013). The typical P & M valuation involves the valuer determining the replacement cost of the P & M asset, and then make deductions for physical deterioration, functional obsolescence and economic obsolescence.

Experience has shown that the inaccuracy problem that usually occurs in P & M valuation is not with the determination of replacement cost but with the quantum of deductions for physical deterioration, functional obsolescence and economic obsolescence. Valuation is

often viewed as both an art and a science. It is an art to the extent that it requires use of a valuer's skill, judgement and experience. However, it is also a social science because it requires the valuer to use scientific modelling of the behaviour of property market participants in determining values they would place on buildings, plant and equipment. One implication of being an art is that valuations might never be exactly consistent (in terms of the valuations of different valuers tallying) or accurate (in terms of valuations being a true reflection of price or worthwhileness). Even where valuers have access to the same replacement cost data and operate contemporaneously, the use of judgement to determine the quantum of depreciation or judgement to select from different models purporting to estimate the quantum of depreciation (where each model has different assumptions), would result in inaccuracy and inconstancy. Appraisers in the United States do not face the problem of accurate or consistent determination of functional and economic obsolescence, because the valuation of functional and economic obsolescence valuations has been scientifically modelled and are documented in their standard textbook 'the Appraisal of Real Estate' (Ogunniyi & Ogunba, 2019). Valuers in other parts of the world may consider adopting or modifying such models without seeking to as it were, 'reinvent the wheel'.

One is not aware of any standard models for the valuation of the physical deterioration (wear and tear of assets) aspect of depreciation even in the United States. Rather, it appears that across the world, a variety of models have been put forward (and are in use) on how to measure physical deterioration of assets. These include estimated percentage depreciation (Shapiro, Mackmin, & Sams, 2012), and several models borrowed from the field of financial accounting: the so-called accelerated methods such as the sum of year's digit and reducing balance; the straight-line method; and the decelerated methods such as the sinking fund model. However, these financial accounting depreciation models have divergent assumptions about how physical deterioration is patterned over service life. For instance, as Ogunba (2013) states, the straight-line depreciation model writes off the value of an asset in a constant rate throughout the useful life of the asset, while the reducing balance and sum of year's digit depreciation models assume a higher depreciation at the early stage of the service life of an asset and a decreased depreciation at the later service life of the asset. The sinking fund depreciation model assumes a higher depreciation in the later years of assets. On the other hand, the estimated percentage depreciation method (which is in popular use in African Commonwealth countries like Nigeria and Ghana) is not based on any definable assumptions or scientific modelling but relies on the valuer's skill, experience and judgement. The accuracy of all these models in terms of being a reflection of the pattern of wear and tear of P & M assets over service life is are very questionable.

The pursuit of accuracy and consistency requires that valuation move more in the direction of a science than in the direction of an art. Science requires the valuer to use scientific modelling of the behaviour of property market participants in determining values they would place on assets. This study accordingly seeks to enhance accuracy and consistency in the valuation of plant and equipment through developing polynomial regression models of physical deterioration. Nigeria is used as a study of how an African country can develop models to enhance its valuation practice. The locational scope of the study is on the western industrial zone of Nigeria and the subject cope is on plant and equipment in the basic metal, iron and steel and fabricated metal product sector.

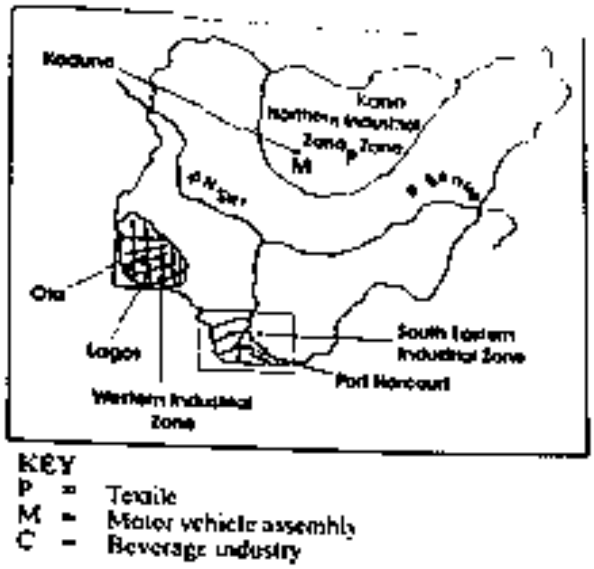


Figure 1: Industrial zones in Nigeria.

The paper is structured into six sections. The first section introduces the paper, stating the problem and the aim of the paper. The second section provides a review of relevant literature. In the third section a methodology is provided while the results and discussion are the focus on the fourth section. The fifth section demonstrates the usage of the models developed while the sixth concludes the paper and provides recommendations.

2.0. Review of Literature

The review of literature is focused on selected empirical papers that have examined depreciation patterns of buildings or plant and machinery over their service life.

Koumanakoos and Hwang (1988) examined the forms and rate of economic depreciation of a selection of assets in manufacturing and non-manufacturing sectors in Canada using the Hulten and Wykoff Box-Cox depreciation model. Most assets were found to have convex depreciation functions. The price-age behaviours of some assets were found to be volatile. Manufacturing industries had convex depreciation functions close to the geometric form for both building construction and Equipment and Equipment with only a few exceptions. In non-manufacturing industries also, the depreciation functions were of the convex geometric form, but with a less pronounced convexity in building construction than in plant and equipment. However, this study was not done in Nigeria.

Wu and Perry (2004) estimated farm equipment depreciation to ascertain which functional form is best in forecasting Equipment depreciation. Observations were gathered from 16 years of auction sales (1984 to 1999) for 17 types of equipment including tractors, combines, corn headers, balers, cotton harvesters, forage harvesters, mower-conditioners, mower-cutters, swathes, discs, plows, drills, planters, manure spreaders, skid steer loaders, and pickup trucks. The study found, using the Box–Cox functional form, that changes in depreciation rates were flexible: sometimes positive or negative (or both). The changes were sometimes linear and sometimes decelerated in conformity with the Sum of Years Digit.

Plimmer and Sayce (2006) examined the methodology adopted by UK valuers when using depreciated replacement cost method in the valuation of building assets with a view to creating a more consistent method for valuers to adopt. It was noted that DRC valuations were based a variety of depreciation methods resulting in yearly variation in valuation estimates. The paper indicated that yearly variation should be the result of market-based factors rather than due to variation in the methods of valuing depreciation and suggested that some form of guidelines to valuers is necessary to ensure consistency in valuation output. However, the study was focused on buildings, not on plant and equipment.

Ogunba (2011) examined the choice of depreciation model valuers adopt in DRC valuation in Nigeria. In a questionnaire survey of valuers, the study observed that cross sectional models, breakdown models and the S curve model were the depreciation models rated as most

suitable for depreciation measurement, but valuers tended to use easiest models (particularly the estimated depreciation model) rather than more suitable models. However, though the study suggested which is most suitable from among available models, the model was designed for buildings rather than plant and equipment. Moreover, the regression version of the model was linear, not capturing the s shape.

Bello (2014) examined perceptions of valuers on the accuracy and consistency of depreciation measurement in the use of the replacement cost method of valuation in Lagos, Nigeria using weighted mean methods. The study found substantial inaccuracy and inconsistency in the use of depreciation measurement. However, the study focused on residential properties and did not extend to model development.

Bello, Ogunba and Adegunle (2015) evaluated the appropriateness of the depreciation approaches used by valuers in the replacement cost method of valuation for buildings in Lagos, Nigeria. Questionnaires were administered on registered estate surveyors and valuers firms in this regard. Responses were analysed using Relative significance indices; the study observed that most respondents viewed an S shaped depreciation pattern as most significant but this depreciation pattern was not used. What was used was estimated depreciation valuation which was rated inaccurate, inconsistent and incapable of separating depreciation components. However, the study focused on residential buildings rather than on plant and equipment and did not extend to model development.

Sahu, Narang, Sahu & Sahu (2016) estimated the economic life of machines for use in the depreciation-replacement model, and presented a straight-line depreciation method, which could be used to determine the economic life of productive equipment and equipment. However, given several studies which suggest that an S shape is more typical of asset depreciation, a straight line model might not accurately represent the movement of the pattern of wear and tear over useful life. Moreover, the study did not consider the influence of operational factors on the service life of P & E.

Okoh, Ebi and Johnson (2017) examined the causes of depreciation in process plant in cement industry from the perception of Estate Surveyors and Valuers practicing in Lagos and Ogun states. Questionnaires were administered. The method of data analysis was Descriptive analysis (Mean Item Score) and statistical package for social science (SPSS). The study revealed that the most important cause of depreciation in process plant in brewery industry is wear and tear. Under physical deterioration wear and tear was the most the most significant factor causing depreciation, others were age, use in service and condition of machine were

ranked super high as the cause of reduction in value. However, the study did not provide information on the level of influence of each of factor.

Ogunniyi & Ogunba (2019) attempted to model plant and machinery in Osogbo, a state capital in Nigeria. They sampled machine operators in this city to determine physical deterioration trends of plant and equipment which were developed into physical deterioration models using log transformations. However, their study was focused on manufacturing companies in Osogbo which is not an industrial city, meaning that only small-scale manufacturing companies could be sampled. Moreover, the use of log transformation regressions produced straight line regression equations which did not reflect the wear and tear patterns suggested in their scatter diagrams. Moreover, the influence of operational factors on the physical deterioration models produced were not included in the analysis which, could lead to underestimations of the quantum of deterioration.

Overall, five gaps were discovered in the review of literature. First, some of the papers focused on the use of DRC on buildings rather than on plant and machinery. For valuation purposes, it is unlikely that the pattern of physical deterioration (wear and tear) observable for buildings is not necessarily the same as the pattern for plant and machinery. Second, some papers did not focus on the situation in African countries. It is necessary for research to have a separate look at the situation in Africa where the wear and tear pattern might be exuberated by harsher operational factors. Third is that some papers stopped short at criticizing accuracy and consistency of depreciation models in popular used but did not embark on model development. Fourth is that the few papers that looked at model development using linear regression or log transformations. Linear regression and log transformations are linear approximations of scatter diagram patterns which inadvertently obscure the scatter diagram patterns of wear and tear. What is required is the modelling non-linear regression relationships (polynomial regression model). This would definitely better capture the actual pattern of wear and tear of plant and equipment. Fifth, is that papers that developed models of physical depreciation did not consider the influence of operational factors on the models so developed. For example, if the same type of plant is purchased for use in the United States and another in Nigeria, the one in Nigeria, may face harsher operation factors such as frequent power outages, less frequent maintenance etc., and may therefore experience more physical deterioration (wear and tear). The influence of operational factors should be included in modelling for greater accuracy.

This study intends to fill all these gaps. Plant and equipment in Sango Ota and Agbara (two of

Nigeria's foremost industrial towns located in Nigeria's western industrial zone State) are used as an example of how physical deterioration modelling in one African country can to enhance accuracy and consistency.

3.0. Methodology

In the study cities – Sango Ota and Agbara - the study focused on plant and equipment in the basic metal, iron and steel and fabricated metal product sector. Discussions with officials of Manufacturers Association of Nigeria and reference to the Association's Directory (MAN, 2019) showed that there are thirty-seven manufacturing companies registered under the basic metal sector in Ogun State, Nigeria.

The intent of the study was to measure the pattern of physical deterioration (pattern of wear and tear) for each plant and equipment in this sector, every two years until the end of their respective useful lives. The study adopted a quantitative (cross sectional survey) design to model the path of movement of expenditure on wear and tear over plant and equipment service life, rather than a longitudinal design. This is because, an earlier study (Ogunba, 2011) had shown that a longitudinal survey would be impracticable for a study of this nature; it would have to span the entire service life of each of the plant and equipment. The study population appropriate for providing information on wear and tear costs were the most senior operators of the plant and machines in the thirty-seven companies. Questionnaire were accordingly self-administered on a cross section of senior (most experienced) plant and equipment operators in the employ of manufacturing companies in the metal sector of the two most industrialised cities of the western industrial zone of Nigeria. The findings were analysed using polynomial (cubic) regression rather than linear regression so as not to obscure the accurate pattern of wear and tear.

The measurement of wear and tear was operationalised by measuring yearly expenditure on repairs and maintenance for each plant/machinery, captured every two years over the plant/machinery service life. A pilot survey conducted in October 2021 indicated that there are nine types of plant and twenty-five equipment (machines) common to companies in this sectorial group. The measurement of wear and tear costs was done for each of these items of plant and equipment.

The procedure was to first inquire into the plant and equipment that are common to the thirty-seven manufacturing companies in the industrial sector and ascertain the service life of

each item of plant and equipment for the purpose of determining the average service life. Next the study investigated the pattern of physical deterioration over useful life, operationalised by measuring yearly expenditure in two-yearly intervals. The next step was to investigate operational factors that could increase or decrease the pattern of expenditure on repairs and maintenance. Finally, the study demonstrated the use of the model for readers of -the paper and for plant and equipment valuers.

The method of physical deterioration considered to be most appropriate for modelling non-linear regression relationships is polynomial regression. The other approach sometimes used for non-linear regression, that is, log transformations - used by Ogunniyi and Ogunba (2019) – was discounted because it produces a straight line. Polynomial regression finds an equation that produces a curved line that closely fits the scatter plot lines. The curved lines are produced using an equation where the independent variables are raised to powers such as X^2 and X^3 depending on the number of inflections (bends). Where there is one bend in the regression line, a squared term (that is, a polynomial of degree two) is added to the independent variables. The polynomial regression equation is described as quadratic and takes the form

$Y = a + b_1X_1 + \ldots + b_2X^2$ ..... (1).
Where there are two bends in the line, the polynomial regression equation is described as cubic and takes the form
$Y = a + b_1X_1 + \ldots + b_4X^4$ ..... (2)

The R^2 results in the regression equation showed the degree to which the independent variables explain the variation in the dependent variable. The p values show the degree of reliability of the alpha and beta coefficients. Generally, where p values are below 0.05, the results could be considered reliable whereas when the p values are above 0.05, the results would have to be interpreted with caution.

4.0. Results and Discussion

The questionnaire was self-administered on senior operators in the basic metal, iron and steel and fabricated metal product sector in the two cities of Sango-Ota and Agbara in the last months (October to December) of 2021. The responses were analysed in the months of February and March 2022 using SPSS software.

As earlier stated, at the first level of inquiry, the study identified the plant and equipment that

are common to the thirty-seven manufacturing companies in the industrial sector, and investigated their respective mean service lives. The findings are documented in Table 1.

Table 1: Service Lives of plant & equipment in basic metal, iron and steel and fabricated metal product sectoral group

Plant	Mean of Service life	Standard deviation of service lives	Equipment	Mean of Service life	Standard deviation of service lives
Steel rolling/ Rolling mill plant	20	0	Straightening machine	15	5.77
Cutting plant	10	0	Blowers	60	0
Aida plant	10	0	Welding machine	23	1.73
Tube mill plant	10	0	Boiler	22	4.04
Water circulation/treatment Plant.	8	0	Compressor	28	11.5
Aluminium coil plant	13	1	Water circulation	36	5.29
			Corrugating machine	40	0
			Embossing machine	36	0
			Lathe Machine	45	0
			Crown making machine	20	0
			Industrial drilling machine	35	0
			Overhead crane/Fork lift	27	0
			Uncoilers	40	0
			Line motors, gear box, drivers	60	0
			Grinding machine	60	0
			Hydraulic machine	29	0
			Hard Diamond / Cutting machine	10	0
			Reversible cold rolling mill	30	0
			Reversible hot rolling mill	34	0
			Billet and slab casting machine	60	0
			Continuous casting machine	60	0
			Stagger blanking machine	60	0
			Melting and holding furnace	35	0
			Slitting line	60	0
			Flat line	60	0

Source: Field survey 2021

From the data gathered, it was observed that the estimated service life of plant such as steel rolling/ rolling mill plant, steel rolling / rolling mill plant, cutting Aida and tube mill plant, Aluminium coil plant and water circulation/ treatment plant in the basic metal sector ranged from 8 to 20 years (standard deviations of 0 to 1), with the most typical service life being 10

years standard deviations of 0). The mean service lives of equipment ranged from 15 to 60 years (standard deviations of 0 to 11.5 years) with the most typical service life being 60 years with standard deviation of 0. These results largely conform with the service lives found the study of Ogunniyi and Ogunba (2019).

Having identified the common plant and equipment and determined the service lives, the next level of inquiry was to investigate the pattern of physical deterioration of each item of plant and equipment over service life. This was achieved by asking the senior operators in the thirty-seven companies to indicate annual expenditure on repairs and maintenance of each plant/equipment every two years until the end of service life. The data obtained were averaged and based on observation of scatter diagrams, model development was based on polynomial rather than linear or log regression. The results are depicted in figures 2 to 28.

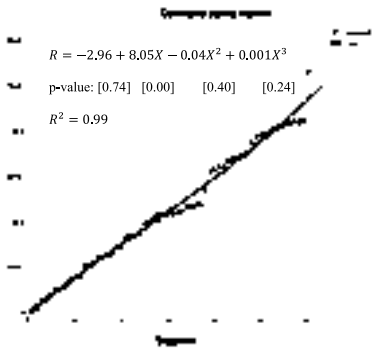


Figure 26: Physical Deterioration of Continuous casting machine

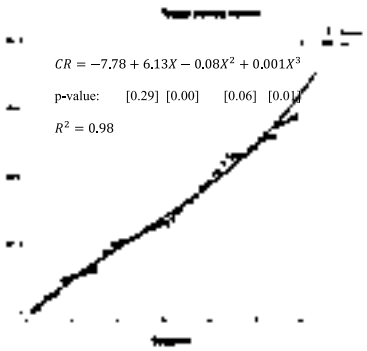


Figure 27: Physical Deterioration of Stagger blanking machine

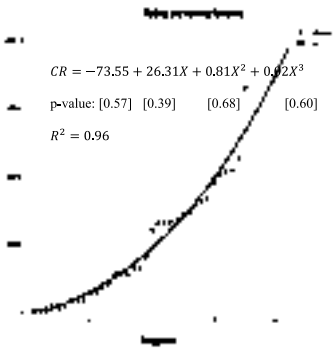


Figure 28: Physical Deterioration of Melting and holding furnace

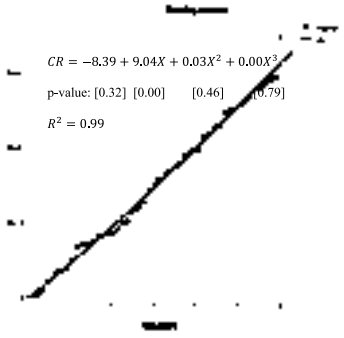


Figure 20: Physical Deterioration of Grinding machine

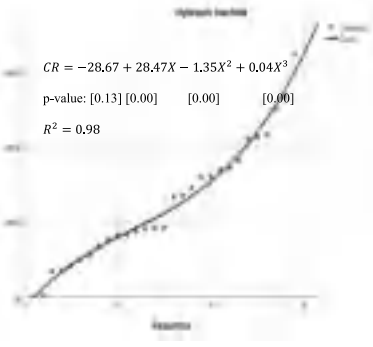


Figure 21: Physical Deterioration of Hydraulic machine

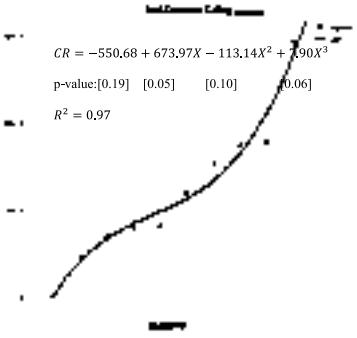


Figure 22: Physical Deterioration of Hard Diamond / Cutting machine

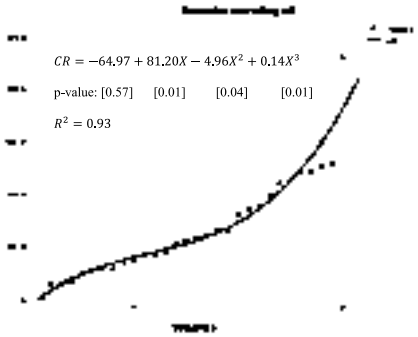


Figure 23: Physical Deterioration of Reversible cold rolling mill

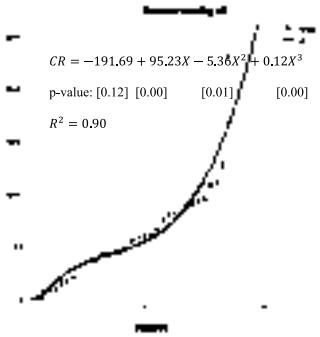


Figure 24: Physical Deterioration of Reversible hot rolling mill

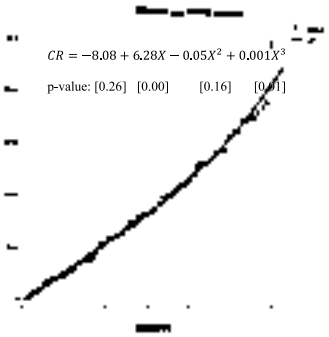


Figure 25: Physical Deterioration of Billet and slab casting machine

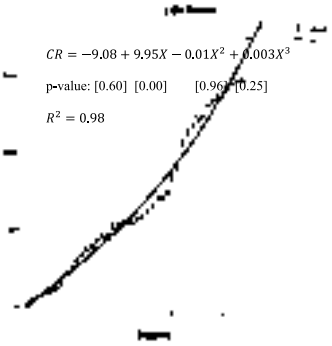


Figure 14: Physical Deterioration of Lathe Machine

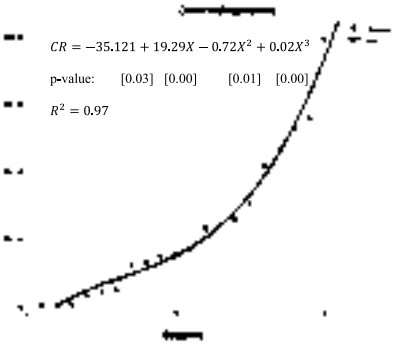


Figure 15: Physical Deterioration of Crown making machine

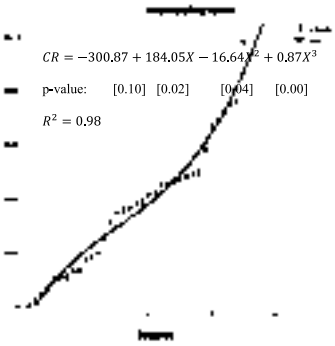


Figure 16: Physical Deterioration of Industrial drilling machine

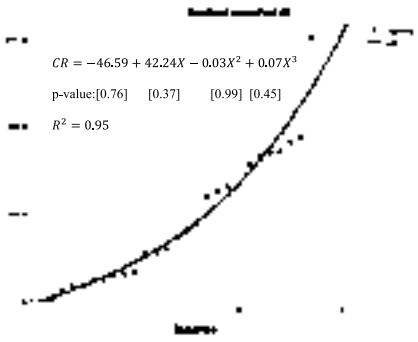


Figure 17: Physical Deterioration of Overhead crane/Fork lift

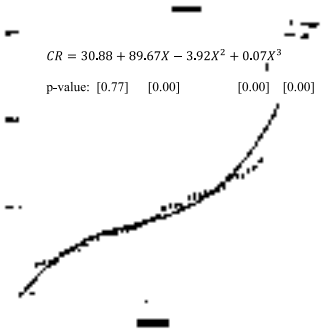


Figure 18: Physical Deterioration of Uncoilers

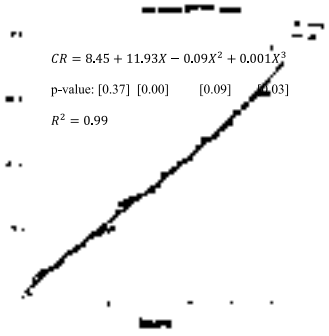


Figure 19: Physical Deterioration of Line motors, gear box, drivers

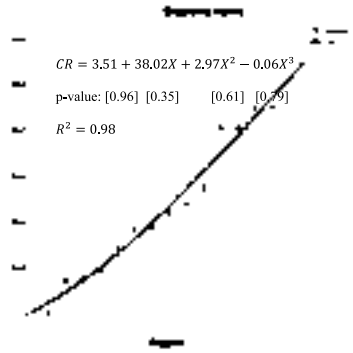


Figure 8: Physical Deterioration of Straightening machine

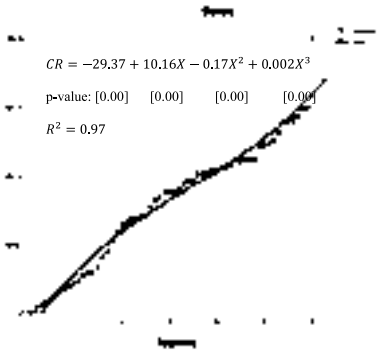


Figure 9: Physical Deterioration of Blowers

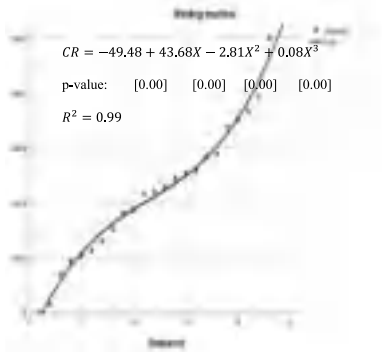


Figure 10: Physical Deterioration of Welding machine

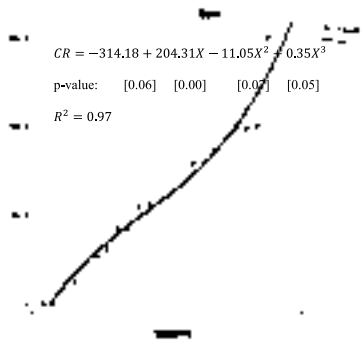


Figure 11: Physical Deterioration of Boiler

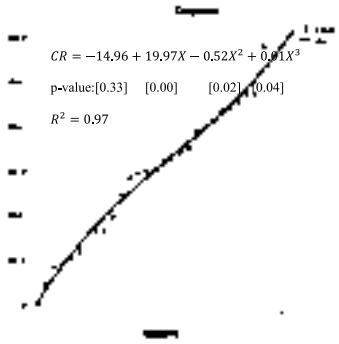


Figure 12: Physical Deterioration of Compressor

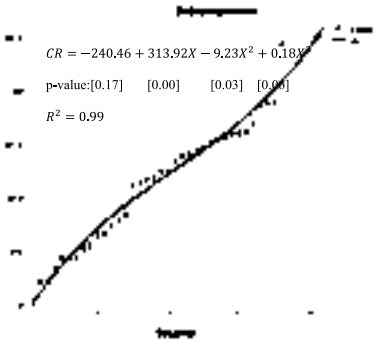


Figure 13: Physical Deterioration of Embossing machine

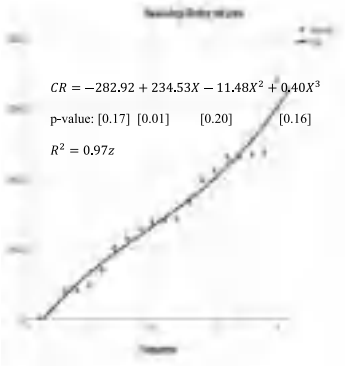


Figure 2: Physical Deterioration of Steel rolling/ Rolling mill plant

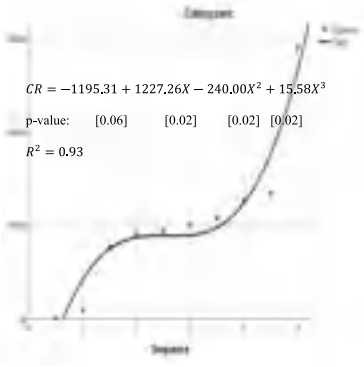


Figure 3: Physical Deterioration of Cutting plant

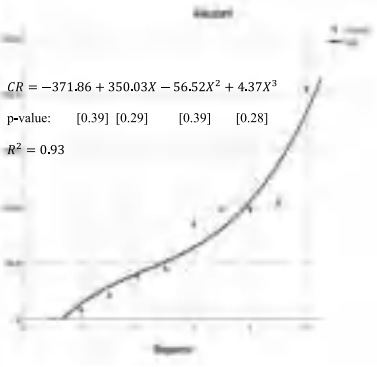


Figure 4: Physical Deterioration of Aida plant

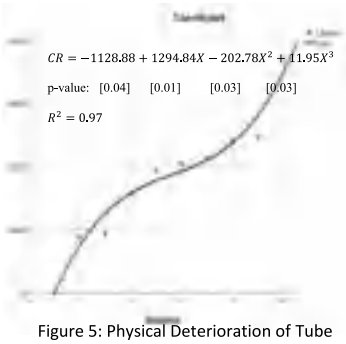


Figure 5: Physical Deterioration of Tube mill plant

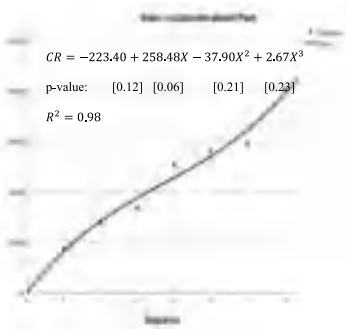


Figure 6: Physical Deterioration of Water circulation/treatment plant

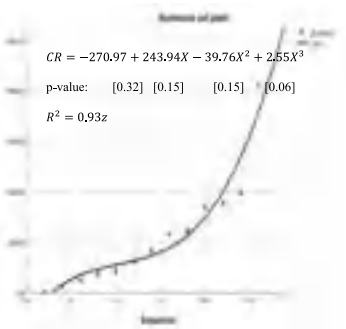


Figure 7: Physical Deterioration of Aluminium coil plant

The regression equations produced from scatter diagrams are somewhat S shaped, typically having two bends. The regression equations were therefore cubic of the form CR = a +b_1X + $b_2X^2 + b_3X^3$.

The R^2 results showed the degree to which the independent variable (time) explains the variation in the dependent variable (cost of repairs). In the physical depreciation models of the plant and equipment (figures 2 to 28), most R^2 results were above 90 percent, indicating that a generally high degree of the variation in cost of repairs is explained by the movement of time till end of service life. The p values showed the degree of reliability of the alpha and beta coefficients. Generally, most of the p values were below 0.05, meaning most of the results are be considered reliable. In the few cases where the p values were above 0.05, the modelling results would have to be interpreted with caution.

Typically, the first one or two years of the S-shape patterns showed zero cost of repair. This is reasonable because brand new plant and machinery would evince minimal or no cost of repair, except there is a factory fault. Plant and Equipment, just like cars, do not develop faults in the first few years (say 0 to 4years). The patterns then show an upward swing (the first bend) from about the 2nd to the 4th year when costs of repairs and maintenance begin to increase, indicating an upswing in wear and tear. Between the 4th to the 6th years, the increase in cost of repairs stabilise, increasing at a decreasing rate, before finally up swinging again. This was the case, generally speaking with most plants and equipment across the basic metal sectors.

This S shape pattern of physical deterioration is in agreement with the pattern in a related study of physical depreciation of buildings by Bello, Ogunba and Adegunle (2015) which also showed an S shape pattern. It is also in agreement with the scatter diagrams in the study of Ogunniyi and Ogunba (2019), though that study's S pattern was later obscured into linear

form by the paper's use of log transformations.

The paper's third level of inquiry was to model the influence of operational factors on the pattern of physical depreciation. Respondents (plant and equipment operators) were presented with various factors potentially influencing the pattern of physical deterioration (that is, level of maintenance, intensity of use of the P & E, work load imposed on the P & E, availability of spare parts, occurrence of power outages and over high electricity voltage). Respondents were presented with a five-point scale of scenarios of these factors (for example, scenarios ranging from overly high intensity of use of machine to scenarios of low intensity of use, and from very frequent maintainace of machines to very infrequent maintainace etc.) They were asked to indicate on a five-point scale by how much the cost of repairs (wear and tear) would increase in each scenario. The conceptual expectation was that with higher workloads on the plant and equipment, higher intensity of use beyond recommended use, higher/very low electricity voltage, and frequent power outage, the result would be an increase in physical deterioration (represented in this study by cost of repairs). Data obtained from this inquiry were averaged and modelled using multiple regression analysis. In the regression equation, the increase in cost of repairs was the dependent variable while the various factors causing increase were the independent variables. The Beta coefficients of each independent variable showed the degree of influence each factor had in increasing the cost of repairs.

The findings are presented in Tables 2 and 3 which pertain to plant and equipment respectively.

Table 2: Regression Results on Increase in Cost of Repair of Plant as a Result of Operational Factors

Sector		Alpha	LM	IU	WL	AS	PO	EV	R^2
Basic metal, iron and steel fabricatec metal product	Beta Coefficient	-8.933	-1.574	4.554	9.077	-6.212	6.432	-3.238	0.96
	P-value	0.002	0.395	0.027	0.000	0.006	0.003	0.085	0.00

Table 3: Regression Results on Increase in Cost of Repair of Equipment as a Result of Operational Factors

Sector		Alpha	LM	IU	WL	AS	PO	EV	R^2
Basic metal, iron and steel fabricatec metal product	Beta Coefficient	-8.933	-0.157	0.455	0.908	-0.621	0.643	-0.324	0.96
	P-value	0.002	0.395	0.027	0.000	0.006	0.003	0.085	0.00

Source: Field survey 2021

Key:
LM = level of maintenance
IU = Intensity of use
WL = Workload
AS = Availability of spare parts
PO = Power outage
EV = Electric voltage

Tables 2 and 3 present the regression beta coefficients of the relationship between operational factors and costs of repairs (physical deterioration). Where there are negative coefficients, this indicate that the more the value of the independent variable on a five-point scale, the less the value of the dependent variable. Positive coefficients indicate that the more the value of the independent variable, the higher the cost of repairs. For example, where there is very high intensity of use with a rating of 5 over 5 and the beta coefficient is 3.591 the increase in cost of repairs would be 5 x 3.591 naira which is 18 naira. Where the beta coefficient is negative, for example – 4.515 for level of maintenance, and assuming higher level of maintenance with a rating of 5 over 5, then additional cost of repair would be - 4.515 x 5 which is minus 23 naira (reducing the cost of repairs).

The R^2 result (R^2 =0.97) indicates that a high (97%) level of variation in the dependent variable (cost of repairs) is explained by the independent variables. The p value of the beta coefficients for QM, FM, SO and CM are less than 0.05, meaning that these beta coefficient are reliable. The p value of the beta coefficient for LM and RM is more than 0.05 but less than 0.10, meaning that the beta coefficients are only reliable at the 90 per cent confidence level and should be interpreted with caution.

Generally, the results are consistent with common sense. It makes sense to see that the more the level of maintenance and availability of spare parts the less the wear and tear (proxied by cost of repairs). It also makes sense to find that the more the intensity of use and power outages, the more the wear and tear (cost of repairs).

5.0. Demonstration of the Use of the Modelling of Physical Deterioration

The paper would now proceed to demonstrate the usage of the physical deterioration model developed. Ogunba (2011) had earlier pointed out that valuers tend to use easiest models rather than more suitable models. The authors are anxious to point to the usability of the

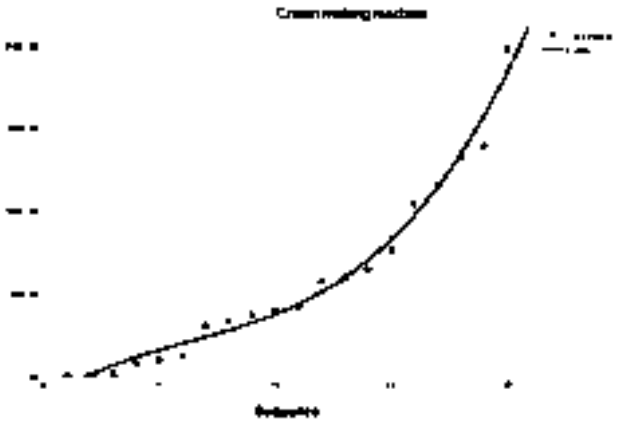
model produced; potential users need not be put off by apparently complex models which may look to them to be another demonstration of academic wizardry.

For demonstration purposes, we may suppose a valuer is asked to value a crown making machine in the basic metal sector (using DRC). We may assume further that the valuer has consulted with the manufacturer and ascertained that replacement cost is 500,000 naira. Physical inspection and inquiry from the operators indicates that the machine has used four years of its service life.

The relevant valuation equation is:
Depreciated Replacement cost = Replacement cost minus (physical deterioration + functional obsolescence + economic obsolescence)

For simplicity, we may assume that the machine is neither functionally nor economically obsolete.

The equation then becomes:
Depreciated Replacement cost = N500,000 - (physical deterioration + 0 + 0).
In the model developed in this paper, physical deterioration is operationalised by cost of repairs. The relevant cubic regression equation for physical depreciation is $CR = -300.87 + 184.05x - 16.64x^2 + 0.87x^3$, where x is the number of years used out of the service life of 20 years (in this case 4 years). Alternatively, instead of using the formula, the amount of wear and tear (cost of repairs) can simply be read off from the regression line in figure 15 as show below.



Thus, given that the plant has used four years of its service life, the physical deterioration (represented by cost of repair) would be CR = -300.87 + 184.05x - 16.64x2 + 0.87x3 = N264.77. However, this cost of repair is a generalised cost of repair that has not taken into account the influence of operational factors peculiar to the machinery being valued. The findings have shown that wear and tear (and cost of repairs) is influenced by levels of maintenance intensity of use, workload, availability of spare parts, power outage and electricity voltage peculiar to the usage of the P and M. The valuer using the model would rate each of these operational issues on a five-point scale drawing from his/her inspection of the plant/equipment and discussions with the operators. The rating of each factor would be multiplied by the corresponding beta coefficient in the regression equation.

In the model, the additional cost of repairs is represented by multiplying the ratings with the beta coefficients in following equation:

$$\text{Additional costs of repair} = -8.93 - 1.57LM + 4.55IU + 9.08WL - 6.21AS + 6.43PO - 3.24EV$$

In a worst case scenario (that is, where the plant or equipment is found to be very badly used), the ratings would be as follows: level of maintenance is extremely low (1 on a 5 point scale), the intensity of use of machine is very high (5 on a 5 point scale), workload on machine is very high (5 on a 5 point scale), availability of spare parts is very low (1 on a 5 point scale), power outages are very frequent (5 on a 5 point scale), and level of conformity of electricity supply with voltages specifications (220 volts) is low (1 on a 5 point scale),

When these ratings are multiplied by the beta coefficients, the equation becomes:

$$\text{Additional costs of repair} = -8.93 - (1.57\ x\ 1) + (4.55\ x\ 5) + (9.08\ x\ 5) - (6.21\ x\ 5) + (6.43\ x\ 5) - (3.24\ x\ 1) = -8.93 - (1.57) + (22.75) + (45.4) - (31.05) + (22.15) - (3.24\ ) = 45.51 \text{ naira}$$

The physical deterioration of the crown making machine in the basic metal sector that has been badly used for 4 years of its service life of 20 years is therefore

$$(CR = -300.87 + 184.05X - 16.64X^2 + 0.87X^3) + (-8.93 - 1.57LM + 4.55IU + 9.08WL - 6.21AS + 6.43PO - 3.24EV) = \text{N}264.77 + 45.51 = \text{N}310.28$$

The valuation is therefore concluded as follows

Depreciation Replacement cost = 00,000 - (N310.28 + 0 + 0) = 499,689.72.51 naira

6.0. Conclusion

The study started with a focus on the problem of inaccuracy and inconsistency in valuation of plant and equipment which is often valued using the depreciated replacement cost method. The problem was narrowed down to inaccuracy and inconsistency in the determination of physical obsolescence where valuers make use of varied methods such as estimated percentage depreciation or methods borrowed from the field of financial accounting. It was noted that financial accounting methods are based on different assumptions of the pattern that physical deterioration follows over service life, ranging from straight line to convex or concave patterns.

The pursuit of accuracy and consistency requires that valuation move more in the direction of a science than in the direction of an art. Science requires the valuer to use scientific modelling of the behaviour of property market participants in determining values they would place on assets. This study has developed a cubic regression model for physical deterioration by tracing the path of costs of repair experienced in the use of plant and equipment over their service life. This model can be combined with mathematical models for economic obsolescence and functional obsolescence already in use by the American Society of Appraisers so as to have a holistic coverage of the three components of depreciation when valuing plant and equipment valuation.

The paper accordingly recommends that in the use of DRC method of valuation, there should be a paradigm shift away from the use of depreciation models like estimated percentage depreciation (which is in popular use in African Commonwealth countries like Nigeria, Kenya and Ghana), as this model is not based on any definable assumptions or scientific modelling. It is largely an art, relying on the valuer's skill, experience and judgement. This method obviously cannot guarantee consistency and accuracy. There should also be a shift away from the use of the financial accounting methods for estimating physical deterioration, since the straight line, concave and convex depreciation patterns suggested by these accounting methods do not reflect the S shaped path of costs of repair actually experienced by machine operators.

The study would also advice that valuers be not put off by what looks like statistical complexity in the use of the cubic regression models; as has been demonstrated, the amount of wear and tear (cost of repairs) for an asset can simply be read off from the regression curve. There are however additional costs to be added after reading off from the regression curve;

the study has found that factors like poor maintenance, intensity of use, excess work load, non-availability of spare parts, power outage and electric voltage fluctuations can increase wear and tear (and cost of repairs) of plant and equipment being valued.

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BARRIERS AND SUCCESS FACTORS TO THE ADOPTION AND IMPLEMENTATION OF REAL ESTATE INVESTMENT TRUSTS (REITS) IN AFRICAN REAL ESTATE MARKETS

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Abstract

The paper investigates the main barriers and success factors to the adoption and implementation of Real Estate Investment Trusts (REITs) in African real estate markets. From their inception in the US more than half a century ago, REITs have seen steady growth across the globe as a distinct label in real estate investment markets Between 1990 and 2021, REITs have grown in both number and market capitalisation from 120 listed REITs in two countries to over 800 in more than 40 countries. Their continued growth has been buoyed by the manifold benefits associated with this investment option, including increased access to the real estate investment markets, improved stock liquidity, steady access to capital, greater opportunities for portfolio diversification and stability, strong record of performance, to name a few. Despite these benefits, the reality is that the REIT regime is predominantly limited to the developed countries, mainly the US and Europe while other countries are still trailing. Africa, in particular, is lagging behind other regions of the world with only a few countries - South Africa, Nigeria, Ghana, Rwanda, Morocco, Tanzania and Kenya - registering considerable success stories. To investigate the main barriers and success factors, the paper is informed by thematic literature review on REITs in general, and those of African region in particular. The major obstacles revolve around the inertia in legislating REITs, inadequately developed capital markets, and the level of property market maturity. Lessons learnt, particularly from South Africa and Nigeria, offer some insights on overcoming these barriers including the providence of the enabling environment for increased market transparency.

Key words: REITs, barriers, success factors.

1.0. Introduction

From their inception in the US more than half a century ago, REITs have seen steady growth across the globe as a distinct label in real estate investment avenues. Between 1990 and 2021, REITs have grown in both number and market capitalisation from 120 listed REITs in two countries to over 800 in more than 40 countries (NAREIT, 2022a). Their continued growth has been buoyed by the manifold benefits associated with this investment option, including increased access to the real estate investment markets, improved stock liquidity, steady access to capital, greater opportunities for portfolio diversification and stability, strong record of performance, to name a few. Despite these benefits, the reality is that the REIT regime is predominantly limited to the developed countries, mainly the US and Europe while other countries are still trailing. Africa, in particular, is lagging behind other regions of the world with only a few countries - South Africa, Nigeria, Ghana, Rwanda, Morocco, Tanzania and Kenya - registering considerable success stories. Thus, this paper investigates the main barriers and success factors to the adoption and implementation of Real Estate Investment Trusts (REITs) in African real estate investment markets. To achieve the above aims, the study was based on a thematic analysis of the literature on the subject to identify the key barriers and success factors.

2.0. The rationale for, and growth, of REITs

A Real Estate Investment Trusts (REIT) can be defined as a type of liquid asset class that allows investors to have access to and participate in a relatively illiquid real estate market without having to trade in the physical assets (Kola and Kadongo, 2017; Sukor, et al, 2020). The emphasis is on the pooling of capital from different types of investors to purchase and manage income producing real estate assets. REITs can be in three forms, i.e., equity REITs, mortgage REITs and Hybrid REITs (Dabara, at al, 2018). Equity REITs tend to engage in ownership and operation of real estate and generating income mainly through rental income. This contrasts with mortgage REITs which primarily invest in mortgages, mortgage-backed securities (MBSs), and similar assets, where the revenue is in the form of interest. Investors can decide on a combination (hybrid) of these two as part of their portfolio diversification strategies. In practice, research has demonstrated that there is a degree of substitutability between equity REITs (EREITs) and mortgage REITs (MREITs). For example, in their study, Lee and Chiang (2004) concluded that the two types of REITs are substitutable, with the

implication that investors can be indifferent in terms of investing in either type of REIT, and that therefore REITs can be treated as a single asset class in the construction of a diversified multi-asset portfolio.

From their inception in the US more than half a century ago, REITs have seen steady growth across the globe as a distinct sector in real estate investment avenues. Between 1990 and 2021, REITs have grown in both number and market capitalisation from 120 listed REITs in two countries to over 800 in more than 40 countries (NAREIT, 2022a). In the developed world, Boshoff and Bredell, 2015 summarised the chronological developments of REIT regimes in selected countries as: USA (1960); Netherlands (1969); Australia (1971); Canada (1993); and UK (2007). In the emerging markets, REITs account for only about 5% of the global REIT market (Marzuki and Newell, 2020).

The rationale for and benefits of REITs are now a subject of platitude as they have been cited by many authors. Chief among the positive attributes is that REITs are relatively a more liquid asset class than direct real estate investment due to their tradability in the stock markets and smaller capital outlay requirements (Chen et al., 2005). Other benefits revolve around steady access to capital, greater opportunities for portfolio diversification and stability, strong record of performance, among others (Marzuki and Newell, 2020; Dabara, 2022). REITs are also said to be good at providing the enabling environment for international competitiveness and increasing attractiveness to foreign investors (Ooi, et al, 2006; Carstens and Freybote, 2018; Schacht and Wimschulte, 2008). REITs benefit communities, economies, and investors. They contribute to economic growth, job creation, environmental stewardship, capital markets development and financial security. Globally, the growth of REITs returns has outperformed bonds, private real estate and stocks (NAREIT, 2022b). Despite these many benefits, the introduction of REITs is something that is still heavy with many challenges, although there is equally no shortage of success stories. The challenges and success stories of REITs are, however, differentiated whether between or within stylised markets. Some of the barriers and success factors will inevitably be unique to emerging markets, such as those of the African region. A review of the development of REITs in Africa should therefore enable identification and evaluation of the barriers and success factors in the adoption of REITs in this region later in the paper.

2.1. Barriers and success factors to development of REITs

Despite the exponential growth of REITs particularly in the developed world, their introductions are not without hurdles. There are a number of challenges as well as success factors that can serve as lessons for the emerging markets. Central to the barriers is the political inertia to enact favourable legislative provisions and rules for REITs. Changes in tax regimes have to be weighed against perceived lost tax revenue and the benefits of introducing REITs. According to Borden, 2015, REITs have sometimes made headlines in major media outlets and caught the attention of policymakers and analysts due to their erosion of the corporate tax base. As such, many countries tend to tread carefully prior to introducing the enabling environment for REITs. For example, despite the US REITs having been introduced as early as 1960, it was not until 1986, that, following some striking changes in the tax laws, there was a significant increase in REIT investment (Borden, 2015). Another challenge to the introduction of REITs relates to timing. Is the timing right for the introduction of REITs in a particular country or region? Just like individual investment decisions, REITs are more likely to succeed if their maiden entry into an economy is at an auspicious time. A case in point is that of the UK REITs which were introduced just at the eve of the 2008 global financial crisis. As a result, the UK REITs were almost immediately plunged into a pragmatic threat, and the crisis saw the enthusiasm for real estate investment disappear (McElroy, 2017). Competition with existing REITs in the region can also cast a shadow of a doubt on the introduction and success of a REIT system. When UK REITs were being introduced, there were already established REITs in other G8 nations with which the UK REITs would be in competition (Petersen, 2004).

The development of domestic securities markets is vital to the adoption and implementation of REITs. Economic growth, legislation, institutional system and governance are core conditions for the development of securities markets (Cuhal and Ştahovschi, 2011, Demirgüç-Kunt et al., 2013). Economic growth stimulates disposable savings as well as investment opportunities. A steady supply of domestic securities instils local market confidence. Low inflation maintains real liquidity and stable exchange rates. Legislation is required to ensure transparency in procedures for operation, dispute resolution, financial and tax reform, and establishment of regulatory bodies to supervise market activities (Drake, 1977, De Serres et al., 2006). An efficient institutional system of intermediaries and underwriters is vital for information communication (Steil, 2001). Equally, a stable governance system that observes the rule of law and respects property rights is required to ensure security of investments (Ahdieh, 2002).

Some of the barriers and success factors will inevitably be unique to emerging markets, such as those of the African region. A review of the development of REITs in Africa should therefore enable identification and evaluation of the barriers and success factors in the adoption of REITs in this region, to which the paper now turns.

2.2. REITs in Africa

One would argue that such investment assets with numerous benefits should be a common feature in developing countries as they would benefit smaller investors in terms of access to the real estate investment market in those countries, but the harsh reality is that these countries, and Africa in particular, are still facing even more pronounced barriers in the adoption of REIT regimes. Writing in the Africa Report, Whitehouse, 2019 suggested that "Africa's real-estate sector will continue to lag behind in terms of attracting foreign investment until legislation to facilitate real-estate investment trusts (REITs) moves up the agenda". Table 1 below shows the introduction of regulation on REITs in selected markets.

Table 1: REIT Introduction and Market Size - Selected Markets 2020

Country	Regulation	Introduced	No. of REITs	REIT Market Size 'bn	Commercial RE Market Size 'bn
South Africa	2013	2013	33	$12.13	$79.37
Nigeria	2013	2007	3	$0.04	$79.98
Ghana	2019	1994	2	-	-
Kenya	2013	2014	2	$0.01	$17.42
Botswana	1994	-	1	$0.08	$4.7
Morocco	2017	2016	1	-	-
Tanzania	2011	2015	1	-	-
Zambia	2020	2017	1	-	-
Rwanda	2013	-	-	-	-
Zimbabwe	2019	-	-	-	-

Source: Author Compilations, (EPRA, 2021)

There seems to be ample evidence that many developing markets have put in place legislation to govern securities markets, and some (including South Africa, Nigeria, Kenya) have further introduced specific legislation for REITs. However, there has been a general paucity of progress in the adoption of REITs. Countries like Egypt, Mauritius, and Tunisia have 13, 5 and 3 listed, but non-REIT property companies, respectively, on their securities markets.

3.0. Limitations in developing securities markets in Africa

The main limitations revolve around economic structure, market depth and cycles, as well as investor confidence.

Economic structure: The supply of securities is affected by economic structures. African economies have largely been structured on the factor-endowment concept. Africa is highly endowed in natural resources. Economic development has concentrated on primary products in agriculture and extractive industries with limited investment in value-adding industrial and service sectors. (UNCTAD, 2021) indicates that Africa's intra and extra service exports are dominated by traditional exports (fuel, manufactured goods and natural resources), which contribute 70% of export services. High knowledge intensive exports account for 25% and non-market for the remaining 5%. Lack of economic diversity exposes securities markets in Africa to highly unstable and unpredictable economic growth. Economic activity tends to be dominated by government state-owned enterprises and multi-national corporations with state-backed concessions, which may not require to source capital through securities markets. Domestic firms are small and mostly family enterprises averse to dilution of control from 'external' capital. Real domestic savings are not only low, but eroded by high inflation. Reasonable savings accrue to unsophisticated financially inexperienced and conservative people inclined to holding cash, bank deposits or acquiring physical assets.

Market depth and cycles: Investors react to the resilience of local capital markets to domestic and international events on capital fund raising and debt obligations. New securities markets are susceptible to market shocks. Securities markets in Africa are quite new, with most having been introduced around 2013-15 (See Table 1 above). Market capitalisation is relatively thin (See Table 2 below). The ratio of stock market capitalisation to GPD of around 20% is far below the global average of 128%.

Table 2: Securities Market Depth - Selected markets 2020

Country	Commercial RE Market Size 'bn	No. of REITs	REIT Market Size 'bn	Stock Market Cap 'bn	GDP Size 'bn	Sock market % GDP
South Africa	$79.37	33	$12.13	$406.81	$282.59	143.96%
Nigeria	$79.98	3	$0.04	$43.91	$442.98	9.47%
Ghana	-	2	-	-	-	-
Kenya	$17.42	2	$0.01	$20.5	$101.05	20.29%
Botswana	$4.7	1	$0.08	$3.34	$15.87	21.05%
Morocco	$24.29	1	-	$64.85	$112.22	57.79%
Tanzania	-	1	-	-	-	-
Zambia	-	1	-	-	-	-
Rwanda	-	-	-	-	-	-
Zimbabwe	-	-	-	-	-	-

Source: (EPRA, 2021)

African economies are characterised by relatively low GDP per capital; the range for economies under consideration being between $2,000 (Kenya and Nigeria) to $6,550 (Botswana).

Investor confidence: Investor confidence in real estate transparency is relatively low. Only South Africa was perceived to be transparent. Global perception of corruption has equally been low (See Table 3 below). Only Botswana and Rwanda were ranked in the top 50 globally.

Table 3: Confidence Scores - 2020 - Selected Markets

	JLL Global Real Estate Transparency			**Transparency International Corruption Perception Index**	
Country	Global Ranking	Composite Score	Transparency Tier	Global ranking	CPI Score
South Africa	24	2.37	Transparent	69	44
Nigeria	68	3.74	Low	149	25
Ghana	80	4.15	Low	75	43
Kenya	52	3.34	Semi	124	31
Botswana	53	3.35	Semi	35	60
Morocco	61	3.60	Low	86	40
Tanzania	95	4.54	Opaque	94	30
Zambia	64	3.65	Low	117	33
Rwanda	78	4.11	Low	49	54
Zimbabwe	-	-	-	157	24

Sources: (JLL, 2021, Transparency International, 2020)

Low investor confidence affects international capital flows into domestic stock markets as returns may not be sufficient to offset the perceived risk. Consequently, securities markets in developing markets rely on domestic capital flows.

Discussion: Barriers and success factors to the adoption of REITs in Africa

Based on the review of the literature, it is apparent that whilst developing countries and Africa in particular are presented with their own unique barriers and success factors to the adoption of REITs, there are obvious commonalities across the globe. Through thematic analysis of the literature, the study has unearthed the following barriers and success factors, as summarised in Figure 1 below.

Figure 1: Barriers and success factors to adoption of REITs in Africa

Figure 1: Barriers and success factors to adoption of REITs in Africa

Source: Author Compilations from thematic literature review (2022)

The above barriers and success factors are, first and foremost, not in any particular order of importance. Secondly, these are heavily interrelated themes. A stable governance system for example, can provide the enabling environment within which all other factors can be influenced. The third point about these factors is that they are not to be perceived in a dichotomous relationship with barriers on one side and success factors on the other. Rather, each of the factors should be viewed as a vernier scale capable of sliding along the line of degree towards achievement. The higher the level of investor confidence in a country, for example, the better the auspicious environment for REITs introduction and vice-versa. Although the paper has identified legislation as central to the adoption of REITs (Whitehouse, 2019), one would argue that there are various other pre-cursors even before thinking of legislating REITs introduction. This is because in most countries where REITs have been introduced, market maturity, for example, was already advanced. Property companies, listed and unlisted, are normally already thriving in those countries, such that the introduction of REITs is normally a mere subject of conversion to REITs rather than creation of new companies. Following the Finance Act 2006, the UK REIT regime was launched in January 2007 and immediately saw a number of UKs largest listed property firms convert to REITs (Deloitte, 2021). Equally, the introduction of REITs in South Africa largely involved Introduction of REITs in South Africa transformation of the Listed Property Sector into REITs

(Boshoff and Bredell, 2015). We therefore see two interdependent factors at play here: the presence of a thriving real estate investment market; and the providence of an equally active and matured capital market. As the literature review suggests, these two requirements are usually lagging behind within the African context, with only South Africa and Nigeria registering considerable success stories in terms of market maturity, and consequently the establishment of REIT systems. It would therefore be premature to even talk about the introduction of REITs in the absence of active capital markets and mature property investments markets in African countries.

In a globalised world, investor confidence and the associated property rights certainties are essential ingredients for the establishment of new products on the market, including REITs. According to JLL (2021) and Transparency International (2020), these are again important areas that African countries are on the tail end of the global village. Although the picture looks gloomy in terms of progress, the fact that some countries within African real estate markets have registered some successes should be sufficient evidence that the barriers can be broken using lessons from elsewhere.

4.0. Conclusions

The many benefits of REITs have been cited by many scholars, so much that the key questions around the subject should now be elevated to the faculties of the impediments and possible lessons for successful adoption. Through thematic analysis of the literature, the paper has highlighted 8 main barriers / success factors to the adoption of REITs in general and to the African context in particular. The paper argues that the factors are heavily interrelated, with some of them capable of triggering multiplier effects that will inevitably lead to fundamental changes in the other factors. Although many scholars have cited legislative provisions as a crucial requirement, the paper argues that this should ideally be preceded by deliberate efforts at achieving property market maturity and enabling thriving capital markets within these countries. Some progress has been made with Africa, and the region is now home to more than 25 stock exchanges which are members of the African Securities Exchanges Association. The increase in the development of capital markets has seen a corresponding rise in the adoption of REITs in Africa, notably in South Africa, Nigeria, Kenya, Ghana, Rwanda, Tanzania, Kenya and Morocco. That some countries in Africa have registered successes means that there is conceivably no need to shop around for new strategies as the lessons from these should be sufficient reference points.

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