Sustainable Real Estate Development and Mortgage: Economic Viability and Market Demand in Enugu Metropolis

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ABSTRACT

Real estate is a crucial component of many economies, serving as a driver of economic activity and providing business and social infrastructure. It is an indicator of a nation's viability and sustainability, reflecting its poverty level. However, the role of real estate in driving economic growth is not fully appreciated in developing economies, including Nigeria. Nigeria's competitiveness in the global real estate market makes the country increasingly attractive to investors. This study aimed to examine the effect of economic viability on sustainable real estate development and mortgage in Enugu Metropolis and the impact of market demand on sustainable real estate development and mortgage in the region. The study used qualitative techniques to collect data from Professional Project Managers from various construction firms across Enugu Metropolis. The findings revealed that Economic Viability in Enugu Metropolis (EVEM) has a positive and significant impact on sustainable real estate development and mortgage in the region. This suggests that it is essential to conduct economic viability before embarking on real estate development to provide informed background information and recommend projects with high profits. The study also highlighted the importance of market demand in influencing sustainable real estate development and mortgage in the region.

Keywords: Sustainability, Real Estate Development, Mortgage, Economic Viability, Market Demand.

INTRODUCTION

Real estate refers to the stock of buildings, land, and vacant land in an economy, used by firms, governments, and households as workplaces or residences. It plays a crucial role in national and global economies, enabling economic activity and providing business and social infrastructure. Real estate development is a major source of employment in various fields, including architects, builders, surveyors, engineers, legal and financial advisors, facilities managers, and construction industry participants. It is also an attractive asset class for institutional investments like pension funds and insurance companies. Real estate is recognized as an alternative asset class for investment funds and makes up the largest single component of a nation's tangible assets, making up the gross assets of national wealth. Real estate performance is an indicator of national economic growth and poverty level. However, the key role of real estate in driving economic growth is not fully appreciated in most developing economies, including Nigeria. Nigeria's competitiveness in the global real estate market is making the country increasingly attractive to investors. The profession of real estate development is becoming more professional and recognized by the public, as a mismatch between work and market needs can result in significant losses.

Objective of the Study

1. To examine the effect of economic viability on sustainable real estate development and mortgage in Enugu Metropolis.

2. To ascertain the impact of market demand on sustainable real estate development and mortgage in Enugu Metropolis.

Scope of the Study

The scope of the study was limited to Enugu metropolis due to the recent boom in construction activities in the state.

Emperical Review

The real estate market needs a broader look, taking into account such aspects as sustainable development, the quality of life, environment quality, public interest, urban development and urban regeneration. Sustainable real estate development contributes to improving quality of life. The added value it creates often exceeds its economic value, because it creates social and cultural value that can ensure a continuity of the property developer's actions, social prestige and pride in one's specialty. On the other hand, some developer's neglect the principles of real estate development and add to the biggest issues that plagued the current trends of development like construction of low density single-function houses in suburbs referred to as urban sprawl. Expanding exurban areas with inferior functions and poor aesthetics increase the need for public infrastructure, up the consumption of natural and energy resources and environmental pollution, and spoil the landscape. Thus, defeating the main essence of real estate development because settlement is nothing without access to public transport, schools, kindergartens or recreational areas, lack works of art, maintenance and beauty (Kaklauskas, 2009). The lack of attention to the measurement of the human or personal impacts or outcomes of sustainability performance systems also appears to be one of the critical shortcomings in this area of policy analysis. For example, while local developers are confident that their buildings can have important, positive impacts on the productivity and health of the employees working in their buildings, to date there have been very few formal, carefully controlled studies of the longer-term health and productivity impacts of new building systems built to United State green rating standards (Loftness, 2008).

Brounen, Marcato and Op't Veld (2021) examine and discuss the application of transparent environmental, social and governance ratings and their interaction with public real estate performance across European markets which starting from the European Public Real Estate Association's (EPRA) Sustainability Best Practices Recommendations (sBPR) database for the listed European real estate market where two environmental, social and governance were constructed to measures and analyze environmental, social and governance completeness and performance. Through a statistical analysis on a sample of 64 European listed real estate firms, the result shows that firms that score highly on environmental, social and governance completeness also tend to score higher than average on environmental, social and governance performance. Lee, Lee and Lee (2020) analyze the impact of natural landscape views on housing prices for apartments in Seoul. Through a visual perception GIS-based model, the Authors describe the natural landscape views of Seoul and the corresponding impact on housing prices. The implementation of a quantile regression that takes into account housing factors as the net surface, the floor level, the location, etc. highlights that natural landscape views have positive impacts on housing prices, in particular for higher-priced apartments. Janhunen, Leskinen and Junnila (2020) sets out to understand the cash flows and economic viability of a real-life smart system investment in a building. The "case building" is a European shopping center located in southern Finland involved in a smart energy investment consisting of PV system, battery storage, active LEDs, EV charging, advanced demand management equal to six million Euro in 2018. After the first full operational year of the smart energy system, another survey was conducted consisting of six representatives of the case building's owner mainly three real estate managers, businesses, development director and the Chief Executive Officer in order to determine the smart readiness indicator, and ability to evaluate building's potential to optimize the overall energy consumption. The case building's final score was 92% of the maximum on the smart readiness indicator rating scale, which indicates that the building is indeed exceptionally smart in terms of its technological implementations. Furthermore, the performance indicators in terms of internal rate of return (IRR), return on investment (ROI), net present value (NPV), and payback period show that the investment is also financially convenient. Klumbyte, Bli˙udžius, Medineckien and Fokaides (2021) presented a multi-criteria decision-making (MCDM) model for the sustainable decision-making, tailored to municipal residential buildings facilities management. The delivered model is applied to twenty municipal social housing buildings of Kaunas city, located in Lithuania, to identify the worst-case real estate, for which strategic decisions have to be made. The proposed model starts from one hundred and nine requirements of three groups for social housing buildings: through expert assessment methods, the requirements was reduced to 30 that is 10

normative, 10 municipal and 10 resident requirements. The main outcomes of the model concern recommendations for the management, use and disposal of municipal buildings, in compliance with the principles of public law, rationality, management efficiency and economic benefits. Kim and Chung (2020) investigate the integration of methods for real estate development planning and feasibility studies in the changing business environments of emerging big data. Through the support of a Valuer of the Korea Land and Housing Corporation, the study used big data to distinguish those factors preferred by business entities planning to implement high-rise building mixed-use development projects, and by consumers who look at such projects, to determine evaluation items. The effects of high-rise mixed-use building development projects are analyzed through four categories consisting of economy and industry, society and culture, technology and environment, and reputation that were divided into thirteen evaluation fields and thirty-nine evaluation factors. The fuzzy inference is used to measure the influence factors of each category and the analytic hierarchy process (AHP) technique is implemented to set priorities based on the factors in each hierarchy. The methodological approach uses different techniques such as analytic hierarchy process (AHP) and fuzzy logic combined with big data for the definition of the highest and best use of high-rise mixed-use buildings.

Unlocking real estate potential requires a proactive and pragmatic approach from all stakeholders in the real estate development sector. The need to unlock the potential of the market has become even more compelling as the dwindling revenues from the oil sector and the pressure to shore up government revenues and open other sectors of the economy have become critical fiscal policy issues. A functional market for real estate develop with well-developed and maintained critical market indices is fundamental to realizing the potential of real estate for economic development. Accurate, timely and accessible real estate development market indices that underpin real estate investment analyses and decisions must be readily available in the market. The paucity of market data and lack of performance benchmark will dissuade institutional investors from investing in Nigeria (Olapade and Olaleye 2018). Data transparency, market information and presence of non-domestic actors and funds are some of the criteria that characterize a mature market (Keogh and D"Arcy1994). Market transparency is a general prerequisite for successful investment in real estate as only transparent markets can create confidence and be attractive to investors (Schulte et al., 2005). A major consequence of lack of market transparency is that accurate risk determination becomes difficult, and this impacts the availability and price of investment capital (Adegun and Taiwo, 2011; Agboola, 2015). The Nigeria real estate market still lacks credible standard benchmarks required for competitive real estate investments decision-making. Generation and maintenance of quality market data remain a serious challenge to real estate market participants. Property data is indispensable and its ready availability, significantly influences the proper functioning of property markets. The Nigerian real estate development market thus remains notoriously opaque because of poor data and information flows thus hampers sustainable real estate development in Nigeria (Ayodele, 2019).

The already established studies were mostly done in the western world. Hence, few studies on the sustainable real estate development in terms of mortgage, economic viability and market demand that had been carried out are not peculiar to Enugu state which the studies tried to consider given the weight of evidence provided by developers, and the current market and political conditions, which favour delivery to meet housing targets and needs.

METHODOLOGY

The research approach adopted for this study was quantitative design. To cover the study area effectively, a field survey was utilized inform of a structured questionnaires for the major study population and anchored with semi-structured interviews for the secondary population and other relevant secondary data. The population of the study consisting of Estates Surveyors and Valuers, Real Estate Developers Association of Nigeria (REDAN), and Professional Project Managers from different construction firm across Enugu Metropolis was Two hundred and fifty thousand (250) while the sample size was One Hundred and Eighty Six (186) which was determined using (Kothari, 2004) formula. Hence, 186 questionnaires were administered out which 40 questionnaires were properly filled and returned for collation represents 57.1% response rate. This response rate was considered enough by the researcher. Quantitative method involving some statistical tools was used for the study comprising of normality test, jarque bera approach, platykurtic, mesokurtic, kurtosis, unit root test, the augmented dickey-fuller approach, F-Bounds, co-integration, autoregressive dispensed lag (ARDL) model, error correction model, and heteroskedasticity test.

RESULTS AND DISCUSSION

In this section, an analysis of the distribution and collection of questionnaire distributed were presented in the following Tables:

Table 1: Distribution and Return of Questionnaire Administered on Professional Project Managers from different construction firm across Enugu Metropolis.

Class of Respondent	Sample Size/Number Distributed	Number returned/ retrieved	Number not returned or improperly filled	Percentage of total number distributed and returned/retrieved	Percentage not returned or improperly filled	Total
Professional Project Managers	186	140	46	75.3%	24.7%	100%
Total	186	140	46	75.3%	24.7%	100%

As depicted in Table 1, 140 questionnaires were distributed to professional project managers from different construction firm across Enugu Metropolis, 140 questionnaires were returned/retrieved, representing 75.3% of the total number of questionnaires distributed while 46 questionnaires representing 24.7% were not returned.

Table 2: Descriptive Statistics

	SREDM	EVEM	MDEM
Mean	83.563441	945.5673	3678.8786
Median	51.460000	273.5600	1225.990
Maximum	325.345000	7283.9100	21750.80
Minimum	0.780000	45.067000	19.113400
Std. Dev.	75.673450	2624.869	3981.676
Skewness	0.893452	3.271432	2.234672
Kurtosis	3.093401	7.981784	4.435672
Jarque-Bera	4.567802	50.184252	8.784289
Probability	0.238734	0.000000	0.032463
Sum	3467.368345	47085.61	97615.08
Sum Sq. Dev.	194562.7	88850232	3.931009
Observations	140	140	140

Table 2 provides summary information of the variables underneath the study, and every variable is provided to have 140 observations. The variables are; Sustainable Real Estate Development and Mortgage (SREDM), Economic Viability in Enugu Metropolis (EVEM), and Market Demand in in Enugu Metropolis (MDEM). The individual Normality test of the Jarque Bera approach suggests that Sustainable Real Estate Development and Mortgage (SREDM) is commonly disbursed over the length below exam, while the records received on

Economic Viability in Enugu Metropolis (EVEM), and Market Demand in in Enugu Metropolis (MDEM) do now not skip the normality test for the reason that their Jarque Bera probability values are much less than 5 percent level of significance. Comparably, the Kurtosis values of those variables show that the Sustainable Real Estate Development and Mortgage (SREDM) is platykurtic, given that their cost is less than 4 (4), that is ok<4. While on the other hand, Economic Viability in Enugu Metropolis (EVEM), and Market Demand in in Enugu Metropolis (MDEM) are "Mesokurtic" as their Kurtosis value is greater than 4 i.e > 4.

Unit Root Test

Table 3: Summary of Unit Root Test

Variables	5% level	Critical ADF	Order of Integration
SREDM	-4.843620	-4.663884	1(1)
EVEM	-4.873502	-4.663884	1(1)
MDEM	-5.653494	-4.685355	1(0)

Table 3 above shows the stationarity properties of each variable under have a look at the usage of the Augmented Dickey-Fuller approach. The prospective economic viability changed into stationary at a level with a 5 percent stage of significance whilst, prospective market demand and sustainable real estate development and mortgage have been stationary at the beginning difference with a five percent stage of importance. The output shows the suitability of the Autoregressive Dispensed Lag model (ARDL) as the correct lengthy-run and short-run regression technique of analysis for this take a look at in view that their stationarity properties reveal an aggregate of I(0) and 1(1) i.e. they are either incorporated of order zero(0) or incorporated of order one(1). Contrary to the orthodox methods of Johansen's check (Johansen 1991), and Vector Autoregression, in this example, the Autoregressive Dispensed Lag (ARDL) approach of regression evaluation may be employed to discover the long-run and quick-run relationship within the dynamic version, having explored and happy the stationarity requirement of the explanatory and explained variables. We will therefore continue to explore if the long-run dating is established in various variables with the aid of carrying out the F-Bounds check for co-integration. The end result of the Autoregressive Dispensed Lag (ARDL) long term Bounds check is likewise offered in Table 4.

F-Bounds Test for Co-integration in Autoregressive Dispensed Lag (ARDL) Model

Table 4: Autoregressive Dispensed Lag (ARDL) Bounds Test of Co-integration

Null Hypothesis: No long-run relationships exist		
	Model II	
Test Statistic	**Value**	**K**
F-statistic	31.43601	2
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	3.25	4.65
5%	4.20	4.98

2.5%	4.68	5.49
1%	5.24	6.01

From table 4, consistent with the submission of Pesaranet al. (2001), it is discovered that the F-statistic cost (31.43601) is better than the asymptotic values in any respect degrees of confidence including the top certain at 1% degree of importance or 99% degree of self-belief. The result indicates proof that the variables of interest have a protracted-run dating or are cointegrated. It implies the lifestyles of long-run joint reversion of the variables to the location of equilibrium. Additionally, this result justifies the suitability of the Autoregressive Dispensed Lag model unique for this observe.

Table 5: Autoregressive Dispensed Lag (ARDL) Estimates of Town Planning Activities in Enugu Metropolis.

Short-run estimates	
Dependent variable	Δ
ECM $_{t-1}$	- 0.835**(0.0000)
ΔSREDM (-1)	0.968**(0.0060)
ΔEVEM	0.0092(0.1378)
ΔMDEM	0.00399(0.4679)
Long-run estimates	
Dependent variable	
ΔEVEM	0.0238 (0.5682) *
ΔMDEM	0.0389 (0.4207) *
C	5.678 (0.18345) *
Adjusted R^2	0.99
F-stat	580.8435 [0.0001]
Note: ***, **, * indicate the statistical significance of coefficients at 1%, 5%, and 10% respectively, and the values in parentheses and block brackets are the probabilities	

Table 5. shows the results of the Error Correction Model (ECM) of the study and after examining the long-run impact of the independent variables in the model of the sustainable real estate development and mortgage: economic viability and market demand in Enugu Metropolis, using the Autoregressive Dispensed Lag (ARDL) model, it is necessary to test for short-run impact and speed of adjustment of the economic viability and market demand variables. The result shows that the Error Correction Model (ECM) parameters were negative (-) and significant which are given -0.835. This means that 84 percent disequilibrium in the previous period is being corrected to restore equilibrium in the current period in the respective models. It has been established that the variables are co-integrated and also have a short-run relationship and impact established from the Error Correction Model (ECM). The result shows that the lagged value Sustainable Real Estate Development and Mortgage (SREDM) in Enugu Metropolis that is (SREDM) (-1) has a positive impact on the current value of the real estate development and mortgage in Enugu Metropolis and the impact was statistically significant in explaining any variation in real estate development and mortgage. Also, the short-run result shows that the Economic Viability in Enugu Metropolis (EVEM) has a positive impact on sustainable real estate development

and mortgage in Enugu Metropolis given the coefficient value of 0.0092 and based on probability value of 0.1378 the Economic Viability in Enugu Metropolis (EVEM) has a positive and significant impact on sustainable real estate development and mortgage in Enugu Metropolis at a 5% level of significance. On the other hand, Market Demand in in Enugu Metropolis (MDEM) has a positive impact on Sustainable Real Estate Development in Enugu Metropolis given the coefficient value of 0.00399 and based on a probability value of 0.4679, Market Demand in Enugu Metropolis (MDEM) has positive and significant impact on sustainable Real Estate Development and mortgage in Enugu Metropolis at a 5% level of significance.

Table 6: Normality Test

Series	Residuals
Sampled Duration	2016 - 2023
Observation	140
Mean	2.367294
Median	8.3826792
Maximum	37.045672
Minimum	14.783456
Std. Dev.	14.784573
Skewness	0.810545
Kurtosis	3.864620
Jarque-Bera	3.234580
Probability	0.325673

The normality test is conducted to ensure that the data employed in this study are normally distributed. Observing from the normality diagram in Table 6 as well as the Jarque-Bera value of 3.23 and its corresponding p-value of 33 % which is greater than 5% significant level, it confirms that the data are normally distributed.

Test for Heteroskedasticity

Table 6: Test for Heteroskedasticity

F-statistic	0.845694	Prob. F (38,3)	0.7345
Obs*R-squared	38.756438	Prob. Chi-Square (38)	0.5234
Scaled explained SS	0.564581	Prob. Chi-Square (38)	1.0000

Table 6 shows the test for Heteroskedasticity. It indicates that the variables are free from the problem of Heteroskedasticity since the p-values of F-statistics and Obs*R-squared of 0.7345 and 0.5234 respectively are greater than the 5% significance level. This outcome is further strengthened by the p-value of 1.0000 for the Scaled explained SS which also suggests the absence of Heteroskedasticity.

FINDINGS AND IMPLICATIONS

Findings from the study revealed that the Economic Viability in Enugu Metropolis (EVEM) has a positive and significant impact on sustainable real estate development and mortgage in Enugu Metropolis. The implication

of always considering economic viability before embarking on any form of real estate development is to have more informed background information on the proposed real estate development in terms of optimistic risk attitude in order to avoid addressing the client's lower risk tolerance and ability to recommend a project with high profits but a high standard deviation of returns as viable while client might not be willing to accept high developer's profits if they are accompanied by a relatively high degree of uncertainty

The study further showed that market demand have a positive and significant impact on sustainable real estate development and mortgage in Enugu Metropolis as it gave preference on the need of stakeholders in real estate development in the region to always understudy the prevailing real estate market structures before embarking in any form of real estate development in the State.

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