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Choice Behavior of Commercial Property Attributes in an Emerging Market: A Multi-Criteria Decision Analysis

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Abstract

Real estate investment decision-making is complicated by a blend of biases and economic challenges, along with the unique characteristics of each property. The study investigates the predictors of commercial property choice behavior in emerging markets, with a specific focus on Lagos, Nigeria. The study employed the Multi-criteria Decision Analysis (MCDA) framework with a specific focus on the Analytical Hierarchy Process (AHP). Data were collected from primary sources through a questionnaire survey of a sample of 601 randomly selected business owners. The study further selected nine (9) experts through an arbitral selection procedure who are actively practising as real estate brokers. The study reveals that location, property identity, and the nature of the business were paramount attributes in commercial property selection in Lagos State, Nigeria. Cognitive factors such as experience and representative heuristics significantly influenced decision-making, reflecting the reliance on past knowledge and perceived similarities amidst market volatility in obscure emerging markets. Macroeconomic volatility and the regulatory environment emerged as critical market dynamics shaping investment preferences. This study is one of the very few studies that have investigated the predictors of commercial property choice behavior in emerging markets, with a focus on Lagos, Nigeria. This is one of the very few studies that contributes to the theoretical understanding of decision-making under uncertainty.

Keywords: Hierarchy process, Commercial real estate investment, Decision analysis, Demand evaluation, Multi-criteria decision analysis

1.0 INTRODUCTION

Real estate investment decision-making is complicated by a blend of biases and economic challenges along, with the unique characteristics of each property (Jackson & Orr 2021). Juxtaposed with the increased macroeconomic unpredictability of emerging markets, like Lagos, Nigeria, characterized by higher volatility, information imbalances, diverse economic conditions and frequent regulatory changes (Asafo-Adjei et al., 2022; Kundu & Paul, 2022), a strong rationale for increasing empirical focus on investment decision analysis in this area is provided. As property investment booms in these markets and attracts attention from investors globally, much of the existing research focuses on developed countries, leaving gaps in our understanding of the peculiar factors that influence commercial property decisions in these dynamic environments (Berre & Le Pendeven 2023; Maggon, 2023). The study confronts this gap using the Analytical Hierarchy Process (AHP) to dissect decision-making processes in Lagos, Nigeria, a vibrant yet volatile property market.

Prospect Theory (Kahneman & Tversky, 1979) condenses decision-making as an outcome of risk averse or risk seeking cognition that is based on perceived gains or losses. However, this perspective may appear vague in its overlooking of the grey contexts of commercial property investment decisions in emerging markets (Ayodele & Olaleye, 2022). The AHP method enriches this framework by establishing a structured hierarchy and pairwise comparisons to assess these trade-offs by prioritising competing attributes, such as location against cost and stability versus growth (Saaty, 1990). The application juxtaposes commercial investment drivers in emerging markets with sustainability or technology features that are currently predominant in developed markets (Hossain et al., 2019).

The apparent bias in related works toward residential property investment decision drivers illuminates the relatively less attention paid to commercial real estate (Kylkilahti et al., 2020; Roos et al., 2022; Zinas et al., 2017). Explanatory variables usually used in such studies include location (Fateye, 2020), affordability (Olanrewaju & Woon, 2017), size (Mody et al., 2023; Park et al., 2007), amenities and facilities (Liu & Shi, 2017; Rahadi et al., 2012), intuition (Iman et al., 2012), lease contractual issues (Duvenhage & Kruger, 2017; Nanda et al., 2021),

regulatory factors (Ma et al., 2023), future growth potential (Ma et al., 2023), sustainability aspects (Mangialardo et al., 2018; Dobrovolskienė et al., 2021) and professional advice (Iman et al., 2012).

Residential assumptions are misleading, though, because the primary factors influencing commercial decisions are different, comprising branding, operational fit, marketability, and business visibility (Gyani et al. 2022). The multiple and occasionally conflicting criteria in commercial contexts, such as location, pricing, infrastructure, and market trends, are difficult to detect because of this disparity, and could obfuscate decision-making clarity (Yuan et al. 2022; Sequeira et al. 2021). AHP's structured technique solves this complexity and provides actionable precision where traditional approaches fall short.

Recent advances in data analytics and machine learning have improved our ability to simulate decision making procedures (Chen et al., 2024). However, the incorporation of these technologies into real estate economics and behavioural finance is still in its nascent stages especially within developing markets. This research advances such synthesis by developing an AHP model that quantifies both the numerical and descriptive aspects of commercial property selection. The analysis transcends traditional variables to include supply elements like business type, property identity, tenant mix, and landmark status, and demand factors, affordability, experience, urgency, and market knowledge, amidst macroeconomic volatility and regulatory instability (Gyani et al. 2022).

Conducted in Lagos, a major commercial centre with a Gross Domestic Product (GDP) of $108 billion (Lagos State Government, 2024), this research not only fills an empirical void but also offers practical insights for stakeholders navigating similar markets. It argues that understanding the contextual drivers, specific to a certain market rather than generic, unlocks theoretical and practical breakthroughs (Asafo-Adjei et al., 2022). The hierarchical quantification of the relative importance of property attributes, cognitive determinants, and market dynamics delivers a replicable framework with implications for academics, practitioners, and policymakers.

Hence, this study seeks to ascertain the predictors of commercial property choice behavior in emerging markets, with specific focus on Lagos, Nigeria. To achieve the aim of this study, this research would ascertain the relative importance of various commercial property attributes in the decision-making process of business owners; identify the cognitive determinants of commercial property choice of business owners; and assess the significance of market dynamics in shaping commercial property investment preferences.

■2.0 LITERATURE REVIEW

2.1 Theoretical Perspectives

Multi-Criteria Decision Analysis (MCDA) is a robust methodological framework designed to address complex decision-making scenarios that involve multiple, often conflicting criteria. It has its roots in decision theory, which elucidates decision-making as a process driven by rational choices under conditions of uncertainty.

Decision theory, in itself, has been profoundly shaped by several key hypotheses. Notably, von Neumann and Morgenstern (1944) laid the groundwork for using game theory to model expected utility as a significant predictor of understanding decision-making under uncertainty. This approach to decision-making is particularly relevant to understanding how business owners navigate the complexities and uncertainties inherent in choosing commercial property attributes in emerging markets. Integrating this with MCDA, particularly the Analytical Hierarchy Process (AHP), allows for a structured comparison and prioritization of property attributes based on their expected utility. This integration enhances the robustness of investment decisions by providing a systematic approach to evaluating and balancing the various factors influencing property selection in emerging markets (Sahoo & Goswami, 2023; Soares et al., 2022).

Aligning with the cognitive import of the second objective of this study, Savage (1954) employed the statistical approach of Bayesian decision theory to adapt expected utility as an outcome of subjectivity, highlighting the influence of cognitive behaviour such as personal beliefs on decision-making frameworks. This subjectivity can be systematically incorporated into MCDA by updating the weights and preferences assigned to different property attributes based on the evolving cognitive perspectives of investors in emerging markets.

In what might be deemed a deviation from the expected utility hypothesis towards an acknowledgement of environmental dynamics, Simon (1955) emphasize the cognitive limitations and practical constraints that real-world decision-makers face, highlighting that they aim for satisfactory solutions rather than optimal ones due to the complexities and uncertainties of their environments. Challenging the notion of perfect rationality, Simon's (1955) concept of bounded rationality aligns with the third objective of the study, particularly in reference to the Availability Heuristics theory (Tversky & Kahneman, 1973). In the context of the uncertainties and data deficits that characterize emerging property markets, the argument that decision-makers tend to overestimate the importance of readily available information when making decisions is particularly relevant (Slovic et al., 1979).

MCDA, particularly through AHP, can accommodate bounded rationality by focusing on satisficing criteria—identifying properties that meet acceptable thresholds across various attributes rather than seeking the optimal solution. This pragmatic approach is particularly relevant in the volatile and uncertain context of emerging markets because overestimating the importance of readily available information when making decisions can lead to biased decision-making, especially where conveniently available, more prominent or recent information disproportionately influences property choices. The MCDA approach allows for the mitigation of these biases by incorporating a broader range of criteria that systematically evaluates the relative importance of commercial property attributes.

The Analytical Hierarchy Process (AHP), developed by Thomas L. Saaty in the 1970s, is a prominent MCDA technique that enables decision-makers to structure complex problems into a hierarchy, perform pairwise comparisons, and derive priority scales (Saaty, 1980). Applying the theory to an elucidation of decision-making in complex situations, Saaty (1990) further extrapolates that the decision problem is decomposed into a hierarchical structure consisting of the overall goal, criteria, sub-criteria, and alternatives. Thereafter, pairwise comparisons of the elements are conducted at each level of the hierarchy, evaluating them in terms of their relative importance, ranging from equal importance to extreme importance.

The hierarchical structuring of AHP simplifies complex decision problems, while the pairwise comparison method ensures a systematic and consistent evaluation process, enabling the resulting priority weights to provide a clear and quantifiable basis for decision-making (Saaty, 1980; 1990). In the context of commercial real estate, this hierarchical decomposition enhances the understanding of choice behavior by breaking down the decision-making process into manageable components, facilitating a detailed analysis of each attribute's significance.

2.2 Conceptual Framework

AHP provides a comprehensive and rational framework for quantifying the decision-making process by breaking it down into a hierarchy of more easily comprehended sub-problems, each of which can be analyzed independently. As a framework for investigating the study's objectives, the following methodological steps are proposed in Figure 1 to align with extant empirical applications of the model (Ilham et al., 2022; Patra et al., 2021; Veisi et al., 2022).

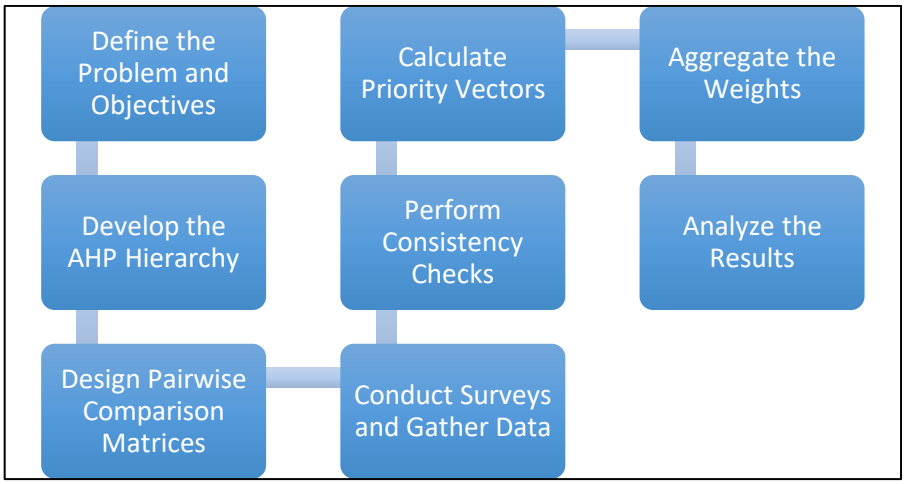

Figure 1 Conceptual Model
(Source: Author's own design, derived from Saaty (1980; 1990))

Figure 1 illustrates the conceptual model which served as the framework of the investigation. The phases on problem definition and objectives identification, hierarchy construction were discussed within this review, while the rest were tackled in the methodology and analysis sections of the paper. So, a broadening of the AHP problem and objectives definition and development are as follows.

2.2.1 Research Problem and Objectives

The problem encompasses the need to understand which attributes are most valued, the cognitive factors influencing valuation choices, and how market dynamics affect investment preferences driving commercial property choice-making. Already, it has been established that evaluating the attributes of commercial properties from the perspective of business owners is a complex decision problem influenced by various factors (Tan et al., 2021). To simplify the process, it is therefore necessary to determine the following.

a. Relative Importance of Commercial Property Attributes

Bangsa & Schlegelmilch (2020) conceptualize attributes as the defining features or aspects of products or services. Gherasim & Gherasim (2023) further elaborate on this by describing attributes as tangible and concrete meanings representing the physical or perceptible characteristics of a product. Stampa et al. (2020) extend this understanding by considering attributes as the preferred characteristics of products, services, or behaviors sought by consumers. Integrating these perspectives, attributes can be comprehensively defined as the intrinsic and physical features, properties, or characteristics that delineate a product or individual.

From commercial property perspectives, significant research interest has been devoted to several key attributes: location, price and lease terms, condition and age of the property (Adnan et al., 2012), amenities (Kole, 2021), infrastructure, technology, zoning and land use compliance (Zheng & Sigler, 2021), environmental considerations (Han et al., 2022), sustainability features, accessibility and transportation links, and vacancy rates (Lockwood et al., 2023).

Usman et al. (2021) underscore the significance of location as a critical attribute in commercial property, employing spatial econometrics to model its impact on property pricing. Their study reveals considerable spatial dependence and heterogeneity within the commercial property market, demonstrating that incorporating spatial effects markedly enhances model accuracy. This suggests a growing reliance on spatial econometrics for commercial property market analysis. Complementarily, Knetsch (2020) developed Commercial Property Price Indices (CPPIs) for Germany, illustrating the importance of price indices as a key attribute in commercial property evaluation.

In the context of Nigeria, Yakubu et al. (2020) identify infrastructure as a pivotal attribute through their investigation of the relationship between road infrastructure expenditures and commercial property investment returns. Their findings indicate that infrastructure investments significantly elevate property values, advocating for increased budget allocations towards infrastructure development. Technological advancements are also pivotal in modern commercial properties, as evidenced by Ryu et al. (2023), who examined the optimization of inkjet-

printed electrodes for flexible thin-film transistors. This highlights the impact of technological innovations on commercial property design and functionality.

Sustainability features are gaining prominence in the commercial property sector. Hossain et al. (2019) analyzed valuers' perceptions of sustainability in the UK commercial real estate market, noting that sustainable building attributes positively influence property values, though they are often underreported by valuers. Additionally, Romanchikov et al. (2024) utilized a geospatial approach to assess public transport accessibility in St. Petersburg, Russia, emphasizing the critical role of accessible transportation in enhancing property values.

Despite the prevalence of these considerations, there remains a notable ambiguity regarding other potential drivers of commercial property choice. Specifically, the influence of proximity to supplier markets, the nature of the business under consideration, the business owner's staple, property identity, tenant mix, property size and layout, and landmark considerations are not yet fully understood within the existing literature.

First, proximity to supplier markets may be a crucial consideration for businesses heavily reliant on timely and cost-effective supply chains. While traditional retail and manufacturing sectors may prioritize closeness to suppliers to minimize logistics costs and ensure the swift delivery of goods, the extent to which this influences property selection is not uniformly applicable across all business types. For example, service-oriented businesses or those involved in digital commerce might not place as high a value on proximity to suppliers compared to industrial or retail businesses (Tana et al., 2023).

Moreover, the specific nature of the business significantly affects property choice. Different businesses have unique spatial and operational requirements. For instance, a manufacturing unit requires ample space for machinery and raw materials, whereas an IT firm might prioritize a modern infrastructure with advanced technological facilities. This implies that the diverse needs of businesses may provide a significant consideration in commercial property choice-making, although scholarly discourse is yet to adequately consider this.

Property identity, encompassing the historical significance and reputation of a commercial property, may play a subtle yet impactful role in investor decision-making. Prestigious properties with a strong brand identity can attract premium tenants willing to pay higher rents. However, this factor's influence is often entangled with other considerations like location and amenities, making it challenging to isolate its impact (Rymarzak & Siemińska, 2012; Šostar & Ristanović, 2023).

Tenant mix, another critical but underexplored aspect, refers to the diversity and compatibility of businesses within a commercial property. A well-balanced tenant mix can enhance a property's attractiveness through a synergistic environment that benefits all occupants. Illustratively, a shopping center with a mix of retail, dining, and entertainment options can draw more customers than a homogenous tenant base. Conversely, certain businesses may not fare well within such environments due to some peculiarities of such businesses. Nevertheless, the strategic composition of tenant mix and its prioritization in property choice require further empirical examination.

Additionally, the specific size and layout of a property are crucial determinants that interact with the business's operational needs. While larger properties with flexible layouts may command higher rents, they also offer versatility for various business activities, potentially attracting a broader tenant base. However, the precise influence of property size and layout on long-term business performance remains ambiguous, as businesses might value different attributes based on their individual needs (Sjödin et al., 2020).

Landmark considerations, such as proximity to significant cultural, economic, or infrastructural landmarks, may also be a crucial and desirable commercial property attribute. In agreement, Cooray (2022) opines that properties near well-known landmarks can benefit from increased foot traffic and prestige. Since landmarks may not always be viewed through positive lens, as Banks (2021) suggests, it becomes imperative to consider its significance as a serious reflection of business owners in pricing commercial properties. Despite this logic, this factor's weight relative to more practical considerations like cost and functionality is not fully understood.

b. Cognitive Determinants of Investment Choice

Cognitive psychology explains how individuals perceive, process, and use information in investment decisions (Mittal, 2022; Weixiang et al., 2022). Highlighting its significance in shaping investment decisions, Ashfaq et al. (2024) found that higher financial literacy reduces cognitive biases in investment decisions among German students, highlighting the importance of financial education in improving investment decision-making. Studies in this area have approached it from the perspective of behavioural finance aspects, notably the impact of cognitive heuristic-driven biases, such as overconfidence and anchoring, on investment management and market efficiency (Ahmad et al., 2023), with conflicting positive/negative outcomes (Ahmad, 2024; Al Rahahleh, 2024).

Cascão et al. (2023) identified heuristics and cognitive biases, including herd behavior, representativeness, availability, and anchoring, as influential in Portugal's housing market, with Abhinandan (2022) adding that these biases are pronounced among high-income, overconfident investors. Alternatively, prospect theory (Kahneman & Tversky, 1979) introduces loss aversion, where losses are weighed more heavily than gains. Impliedly, this can cause risk-averse behavior and the disposition effect, where investors hold onto losing investments too long (Oreng et al., 2021).

Conversely, these cognitive insights primarily address general investment decisions, with specific research on commercial property choices remaining relatively limited. Within the market imperfection of emerging markets (Akinci & Queralto, 2024; Rodgers et al. 2022), other cognitive issues such as affordability, lack of knowledge and experience about the real estate market, and urgency in acquiring commercial space are likely relevant for commercial property decisions as well. So, understanding them is crucial for explaining business owners' decisions in selecting commercial properties.

c. Market Dynamics

Ivanyuk (2021) provides remarkable insights into the pivotal role market dynamics play in shaping investment decisions with their emphasis that volatility and risk in the stock market necessitate continuous adaptation from investors. The influence of market conditions extends to real estate investments, where fluctuations in the broader economic landscape can significantly impact property values and investment

attractiveness (Taşan-Kok et al., 2021). Similarly, Kaklauskas et al. (2021) discuss how real estate market cycles affect investment strategies, with Goldstein et al. stressing that periods of boom and bust require different approaches to risk management and opportunity identification.

Highlighting some of these approaches, Jones & Trevillion (2022) state that during market upswings and economic volatility, investors might prioritize growth and expansion, whereas downturns necessitate a focus on stability and risk aversion. In agreement, Yadav (2021) posits that macroeconomic volatility often led to a reevaluation of investment portfolios, with a shift towards assets perceived as safer. This behavior is crucial in commercial property investment, where economic signals significantly influence investor confidence and decision-making processes (Hala et al., 2020).

Additionally, Moran et al. (2021) illustrated how regulatory policies can create an environment conducive to investment or pose barriers that deter potential investors. This is better appreciated within emerging markets contexts due to the unique challenges and opportunities they present for investors. Explicitly, Asafo-Adjei et al. (2021) show that emerging markets often experience higher levels of economic instability, which can lead to greater risk but also potential for substantial returns if managed correctly. This duality necessitates a considered approach to investment, emphasizing the reflections on balancing the pursuit of high returns with risk management strategies tailored to the unique characteristics of emerging markets.

Still, despite extensive research on these market dynamics and their influences on general investment decisions, there is limited understanding of how specific market dynamics influence commercial property choices. Most studies focus on broad investment behaviors rather than the complexities of commercial real estate investment. Some examples are provided by Himanshu et al. (2021) and Yoshino et al. (2021) who appraised market dynamics impacts on real estate portfolio selection during pandemic periods. Additionally, the impact of uncertain and obscure emerging markets on investment choices requires further exploration to provide a comprehensive view of investment decision-making, particularly in commercial property choices. Following these arguments, the study was conducted in Lagos, a key commercial hub in Africa, to investigate the factors influencing investors' selection of commercial properties.

2.2.2 AHP Hierarchy Development

Following the identification of the objectives and the conceptual review, the next step in the research model (Figure 1) is to develop the AHP Hierarchy (Table 1) comprising the goal, criteria and sub-criteria, and alternatives (Daniyan et al., 2020; Ho, 2008; Şahin, 2021; Saaty, 1990).

Table 1 Groups of Decision Goal, Criteria, Sub-criteria and Alternatives for Commercial Property Choice-making

Level	Measure	Explanation
1	**Goal**	To ascertain the choice behaviour of commercial property attributes in emerging markets. This goal encompasses identifying the key attributes that drive choice behavior and elucidating how these preferences are shaped by various determinants and market dynamics.
2	**Criteria**	
	a) Commercial Property Attributes	Various physical and functional characteristics of commercial properties.
	b) Cognitive Determinants	Psychological and cognitive factors influencing decision-making.
	c) Market Dynamics	External economic and regulatory factors.
3	**Sub-criteria**	
a)	**Commercial Property Attributes**	These are the tangible aspects of commercial properties that directly impact their attractiveness and suitability for business.
	Location	Proximity to business districts, transportation hubs, customer bases, and landmark considerations consistently a top priority (Fateye, 2020).
	Price and Lease Terms	Acquisition or rental costs and lease flexibility, key financial considerations for investors.
	Property Identity	Unique characteristics and branding potential, reflecting reputation and market appeal (Rymarzak et al., 2012).
	Business Nature	Suitability of the property for the specific operational needs of the business, a survey-highlighted factor.
	Infrastructure	Availability and quality of essential services (example, electricity, roads), critical in Lagos's context (Yakubu et al., 2020).
b)	**Cognitive Determinants**	These refer to the mental processes and biases that affect how business owners perceive and evaluate commercial properties.
	Experience	Prior knowledge and investment history, a dominant influence in data-scarce markets (Mittal, 2022).
	Representative Heuristic	Judgments based on perceived similarities to past examples, prevalent in uncertain environments (Tversky et al., 1973).

	Risk Perception	Assessment of investment risks heightened in volatile markets like Lagos.
	Financial Literacy	Understanding of financial concepts, influencing decision quality (Ashfaq et al., 2024).
	Data Adequacy	Availability of reliable information, critical in emerging markets with data deficits.
c)	**Market Dynamics**	These include broader economic dynamics that affect market stability, investment risk, and ultimately the decision-making process.
	Macroeconomic Volatility	Economic fluctuations impacting property values and investor confidence (Ivanyuk, 2021).
	Regulatory Environment	Government policies and regulations shaping the market, a key concern in Nigeria (Moran et al., 2021).
	Market Conditions	The current state of the property market and its predictability, reflecting uncertainty in Lagos.
	External Shocks	Unforeseen disruptions (example, pandemics, political instability), significant in emerging economies (Asafo-Adjei et al., 2021).
4	**Alternatives**	Various commercial property options that are available in the market and being considered by business owners in the study area.

(Source: Author's own work)

Table 1 sets the tone for evaluating the decision-making model, by using the AHP methodology to examine the criteria and sub-criteria for choosing a commercial property amongst a set of alternatives. The selection of criteria and sub-criteria combined a deductive approach from extant research (Fateye, 2020; Iman et al., 2012) with inductive insights from a survey of 601 Lagos business owners to ensure relevance to the emerging market context (Duleba & Moslem, 2018). Factors like location and price may appear universally relevant, but the survey presented other sub-criteria, tailored to Nigeria's context. These include landmark considerations, reflecting consideration of prominent institutional and socioeconomic hubs, and business owner's staple which captures considerations of business-specific needs.

■3.0 METHODOLOGY

This study employed the AHP method, to prioritize commercial property attributes and elucidate the cognitive and market-driven factors shaping investor choices in Lagos, Nigeria. AHP was chosen over other MCDM methods, such as TOPSIS, ELECTRE, or PROMETHEE, for its hierarchical structure and capacity to quantify subjective expert judgments, essential in Lagos's data-scarce, perception-driven market. AHP leverages expert judgments through pairwise comparisons to derive priority weights, making it well-suited for dissecting complex decision-making in real estate contexts where subjective and objective factors intertwine (Saaty, 1980, 1990). In this study, the methodology proceeded in two distinct phases: first, an initial survey enriched the AHP framework with real-world insights (Duleba et al., 2018), and second, an expert-led evaluation quantified preferences with precision (Hutcheson & Newell, 2018).

3.1 Initial Survey and Hierarchy Development

The research began with a survey of 601 business owners in Lagos, conducted from late 2023 to early 2024, to ground the AHP hierarchy in real-world preferences (Duleba et al., 2018). Using Godden's (2004) sample size formula, the sample was representative and diverse, comprising 63% female and 37% male business owners, predominantly aged 31–59, and mostly married. The survey 601 business owners identified key attributes, cognitive factors, and market dynamics influencing commercial property choices, providing a foundation for the AHP hierarchy (Table 1). Although these findings did not directly inform the AHP pairwise comparisons, those being the domain of expert judgment, they played an essential role in grounding the criteria and sub-criteria in the tangible concerns of investors (Ho, 2008; Hardie & Newell, 2011; Hutcheson et al., 2018).

The AHP hierarchy was constructed following Saaty's (1990) recommendation of 3–7 sub-criteria per criterion to maintain analytical clarity and expert manageability. Drawing from the literature (Fateye, 2020; Mittal, 2022) and survey insights (Duleba et al., 2018), three main criteria were established: commercial property attributes, cognitive determinants, and market dynamics. Each criterion was assigned a concise set of sub-criteria, distilled to capture essential decision factors without overwhelming the process (Ho, 2008; Hutcheson et al., 2018) (Table 1).

3.2 Expert Selection and Study Area

The robustness of AHP hinges on the expertise of evaluators, and this study carefully selected a sample of real estate professionals to perform the pairwise comparisons. Experts were sourced from the Nigerian Institution of Estate Surveyors and Valuers (NIESV) and the Real Estate Developers Association of Nigeria (REDAN) through a purposive sampling strategy. The selection criteria included a minimum of 15 years of experience in commercial real estate, active brokerage practice, and deep familiarity with Lagos markets. From an initial pool of 15 candidates, 6 were excluded due to inconsistent or incomplete evaluations, yielding a final set of 9 experts, aligning with Saaty's (2008) recommended range of 5–9 and consistent with comparable AHP studies in real estate (Ho, 2008; Hardie et al., 2011; Hutcheson et al., 2018).

Lagos, Nigeria, the study area, is a dynamic economic hub with an estimated GDP of $108 billion, ranking fourth in Africa (Lagos State Government, 2024). As West Africa's leading commercial center, it hosts diverse industries, encompassing finance, oil and gas,

transportation, and entertainment, accounting for 26.7% of Nigeria's GDP and over 50% of its non-oil economy. This vibrant yet volatile context, marked by regulatory shifts and macroeconomic instability, makes Lagos an ideal case for examining commercial property choice behavior in an emerging market.

3.3 Study Design and Data Collection

We decomposed the decision problem into a hierarchy (Figure 1) and conducted pairwise comparisons to quantify the relative importance of criteria and sub-criteria (Saaty, 2008). The hierarchy, informed by the initial survey of 601 business owners, guided the design of a questionnaire administered to the 9 experts, who drew on their professional insights into client decision-making in Lagos (Duleba et al., 2018). Each expert assessed pairs of elements within the hierarchy using Saaty's (1980) 1–9 scale (Table 2), where 1 signifies equal importance and 9 indicates extreme preference. For instance, comparing 'location' to 'price and lease terms' under commercial property attributes, an expert might assign a 3 if location is moderately more important, with a reciprocal value (1/3) for the reverse comparison.

Table 2 Pairwise Comparison Scale

Numerical Scale	Verbal Scale	Explanation
1	Equal importance	Both elements contribute equally to the criterion
3	Moderately more important	One element is moderately preferred over the other, based on expert judgment.
5	Significantly more important	One element is strongly preferred over the other, based on expert judgment.
7	Much more important	One element is very strongly preferred, consistent with significant practical evidence.
9	Extremely important	One element is dominant over the other, supported by compelling evidence.

* Note: Scales 2, 4, 6 and 8 were used to express intermediate scenarios

(Source: Saaty, 1980)

With three criteria and 14 sub-criteria, the process required 49 pairwise comparisons per expert, calculated as $n(n-1)/2$ across levels: 3 for the three criteria, 10 for 5 sub-criteria under commercial property attributes, 10 for cognitive determinants, and 6 for market dynamics (Saaty, 1990). Comparisons were conducted in a single session per expert, supported by clear instructions and examples to ensure judgment quality, with consistency checks confirming response reliability. Each expert's responses were recorded in pairwise comparison matrices, normalized to derive eigenvectors (relative weights), and aggregated using the geometric mean (Aczél & Saaty, 1983) to reflect the collective judgments of the 9 experts. For a set of n attributes, the matrix is an n x n table where entry a_{ij} represents the importance of attribute i relative to j. For example, a matrix for three attributes (location, price and lease terms, property identity) might be:

$$\begin{pmatrix} 1 & \mathbf{3} & \mathbf{5} \\ 1/3 & 1 & 2 \\ 1/5 & ½ & 1 \end{pmatrix}$$

Here, **3** indicates location is moderately more important than price and lease terms, and **5** shows it is strongly more important than property identity, with reciprocals (1/3, 1/5) reflecting reverse comparisons. Normalization involved dividing each column entry by its sum. For example, the calculation of relative weights in the AHP framework, where the sum of the first column as 1 + 1/3 + 1/5 is 1.533, derives eigenvector values of 0.652, 0.217, and 0.131 (Ugboma et al., 2006; Saaty, 1990).

$$\text{Normalized first column} = \begin{pmatrix} 1/1.533 \\ 0.333/1.533 \\ 0.2/1.533 \end{pmatrix} = \begin{pmatrix} 0.652 \\ 0.217 \\ 0.131 \end{pmatrix} \quad \text{Eigenvector}$$

The consistency checks employed Consistency Ratio (CR = CI/RI), where CI = $(\lambda_{max} - n)/(n-1)$, RI is the random index, and CR < 0.1 confirmed reliability (Liu et al., 2020). λ_{max} is the maximum eigenvalue of the matrix, and n is the number of attributes. Given the involvement of diverse survey respondents, Aczél et al. (1983) emphasize the necessity of aggregating the preferences of each participant into a consensus

conclusion. To achieve this, the geometric mean of individual decisions is used to capture the central tendency of the dataset by calculating the product of the pairwise comparison values (Equation I):

$$a_{ij}^{group} = \left(\prod_{k=1}^{m} a_i^k \right)^{1/m} \quad \text{(I)}$$

Where a_{ij}^{group} is the aggregated value for the pairwise comparison of attributes i and j, a_i^k is the value from participant k, and m is the total number of participants (9). The aggregated values were used to construct a final pairwise comparison matrix to reflect the collective judgments of all participants, the eigenvector of the normalized aggregate matrix was calculated to determine the final weights of the commercial property attributes. While the methodology is broadly applicable, the findings are attuned to Lagos-specific factors, such as infrastructure challenges and economic volatility, suggesting the need for local adaptation in other contexts.

4.0 RESULTS

To ensure the validity and robustness of the AHP results, individual CRs for each of the nine experts were calculated, providing a granular assessment of response reliability across the three criteria: commercial property attributes, cognitive determinants, and market dynamics (Table 3).

Table 3 Consistency Ratios per Expert for AHP Criteria

Expert	Commercial Property Attributes	Cognitive Determinants	Market Dynamics
1	0.018	0.005	0.062
2	0.023	0.007	0.070
3	0.019	0.006	0.064
4	0.021	0.008	0.068
5	0.017	0.004	0.060
6	0.022	0.006	0.066
7	0.020	0.005	0.063
8	0.018	0.007	0.067
9	0.020	0.006	0.065

(Source: Author's own work)

All values in Table 3 are below 0.1, confirming consistent expert judgments. Aggregate CRs, reported subsequently in Tables 5 – 7, reflect the geometric mean of these individual assessments.

To ascertain the relative importance of various commercial property attributes in the decision-making process of business owners, the following results emerged from the AHP analysis. First, Table 4 presents the priority weights of the three main criteria, followed by Tables 5 – 6, which rank sub-criteria within each criterion by their normalized priority vectors to highlight the most influential factors in commercial property selection in Lagos, Nigeria.

Table 4 Relative Importance of Main Criteria

Criterion	Priority Vector	Ranking
Market Dynamics	0.42	1
Cognitive Determinants	0.31	2
Commercial Property Attributes	0.27	3

*Priority vectors reflect the normalized eigenvectors from aggregated expert judgments (Saaty, 1990)

(Source: Author's own work)

Table 4 reveals the relative significance of the three main criteria influencing commercial property choice in Lagos, Nigeria, as evaluated by 9 experts. Market dynamics emerges as the most critical factor (0.42), securing the top ranking. This suggests that external economic and regulatory conditions, such as macroeconomic volatility and external shocks, exert the strongest influence on investment decisions, likely

reflecting Lagos's volatile emerging market context where stability is a primary concern. Cognitive determinants, on the other hand, with a weight of 0.31, implying that psychological and behavioural factors, such as experience and heuristics, play a substantial but secondary role. The implication is that even in data-scarce environments, market dynamics is a considered more important than reliance on personal characteristics. Commercial property attributes, with a priority vector of 0.27, ranks third, implying that while tangible property features like location and infrastructure are important, they are the least decisive than market conditions and cognitive influences in shaping preferences. Collectively, these weights (summing to 1.0) highlight a decision-making landscape where external uncertainties outweigh property-specific and cognitive factors.

Table 5 Relative Importance of Commercial Property Attributes

Attribute	Priority Vector	Ranking
Location	0.317	1
Property Identity	0.284	2
Business Nature	0.189	3
Price and Lease Terms	0.128	4
Infrastructure	0.082	5

*Criterion weight = 0.27

(Source: Author's own work)

The results in Table 5 emphasize location (0.317) as the top attribute, emphasizing its pivotal role in commercial property selection, followed closely by property identity (0.284), which highlights the value of branding and reputation. Business nature (0.189) ranks third, reflecting the importance of aligning properties with operational needs, while price and lease terms (0.128) and infrastructure (0.082) indicate moderate influence.

Table 6 Cognitive Determinants of Commercial Property Choice of Business Owners

Attribute	Priority Vector	Ranking
Experience	0.293	1
Representative Heuristic	0.261	2
Data Adequacy	0.198	3
Risk Perception	0.139	4
Financial Literacy	0.109	5

*Criterion weight = 0.31

(Source: Author's own work)

Table 6 reveals experience (0.293) and representative heuristic (0.261) as the leading cognitive determinants, suggesting business owners heavily rely on past knowledge and perceived similarities, likely due to data scarcity in emerging markets. Data adequacy (0.198) ranks third, reinforcing the need for reliable information, while risk perception (0.139) and financial literacy (0.109) probably indicate a balanced focus on risk assessment and financial understanding in decision-making.

Table 7 Market Dynamics Shaping Commercial Property Investment Preferences

Attribute	Priority Vector	Ranking
Macroeconomic Volatility	0.379	1
External Shocks	0.302	2
Regulatory Environment	0.197	3
Market Conditions	0.122	4

*Criterion weight for Market Dynamics = 0.42

(Source: Author's own work)

Table 7 shows macroeconomic volatility (0.379) as the most influential market dynamic, followed by external shocks (0.302), reflecting Lagos's susceptibility to economic fluctuations and disruptions like political instability. Moreover, regulatory environment (0.197) and market conditions (0.122) complete the ranking, buttressing the impact of policy and uncertainty on investment preferences.

■5.0 DISCUSSION OF RESULTS

The study's application of the AHP in Lagos, Nigeria, reveals a hierarchy of influences shaping commercial property choice in an emerging market, with market dynamics (0.42) outranking cognitive determinants (0.31) and commercial property attributes (0.27). Within these, macroeconomic volatility (0.379) and external shocks (0.302) dominate market dynamics, experience (0.293) and representative heuristic (0.261) lead cognitive factors, and location (0.317) and property identity (0.284) top property attributes. The results align with prior research emphasizing volatility's role in emerging markets (Asafo-Adjei et al., 2022; Kundu et al., 2022), yet they challenge assumptions from developed markets where property attributes like sustainability often take precedence (Hossain et al., 2019; Jackson et al., 2021).

The prominence of market dynamics reflects Lagos's volatile context, in contrast with developed markets where stable conditions allow focus on intrinsic property features (Jessup et al., 2022). Similarly, the high weighting of experience and heuristics underscores bounded rationality (Simon, 1955) and prospect theory's loss aversion (Kahneman et al., 1979), as business owners lean on past knowledge amidst data scarcity (Tversky et al., 1973). Location's enduring priority echoes global real estate axioms (Fateye, 2020; Usman et al., 2021), but property identity's strength (0.284) introduces a novel dimension, placing branding and reputation as rivals to traditional metrics like price (0.128) in Lagos, emphasizing a finding less pronounced in studies of mature markets.

Comparatively, in developed markets, sustainability and technological features often rank higher (Hossain et al., 2019; Ryu et al., 2023), while in other emerging markets like India, volatility similarly drives decisions (Kundu & Paul, 2022). This study's integration of cognitive and market factors with property attributes bridges a gap noted by Gyani et al. (2022), offering a holistic view absent in residential-focused research (Kylkilahti et al., 2020). Critics might argue these insights are intuitive to practitioners, yet the AHP's structured quantification, validated by low consistency ratios (Table 3), elevates anecdotal knowledge into actionable, evidence-based priorities.

■6.0 CONCLUSION

Thus, this research illuminates the intricate decision-making landscape for commercial property investment in Lagos, Nigeria, affirming that market dynamics, particularly macroeconomic volatility and external shocks, exert the greatest influence, followed by cognitive reliance on experience and heuristics, with location and property identity anchoring property-specific preferences. Its adoption of AHP within an emerging market not only validates the adaptability of MCDA frameworks but also extends Prospect Theory's relevance to commercial real estate under uncertainty. Accordingly, the study transforms practitioner insights into a rigorous, replicable model that offers lessons for other emerging markets where volatility and data deficits prevail.

Theoretically, this study enriches decision-making under uncertainty by integrating AHP with Prospect Theory and bounded rationality, a synthesis that bridges between decision theory and real estate scholarship. The dominance of market dynamics (0.42) over cognitive (0.31) and attribute (0.27) factors challenges von Neumann et al.'s (1944) expected utility model, aligning instead with Simon's (1955) satisficing under constraints and Kahneman et al.'s (1979) risk-averse tendencies in volatile settings. The high weighting of experience (0.293) and representative heuristic (0.261) corroborates Tversky et al.'s (1973) availability heuristic, extending its application from general investments (Mittal, 2022) to commercial real estate, which is a domain underexplored in behavioural finance (Cascão et al., 2023).

For researchers, the study stresses AHP's utility in dissecting complex real estate decisions, encouraging its broader adoption in emerging markets beyond Lagos (Sahoo et al., 2023). The findings, prioritizing volatility over attributes, suggest a need to recalibrate models from developed markets (Jackson et al., 2021) for emerging market contexts like Nigeria, India, or Kenya, where external shocks dominate (Asafo-Adjei et al., 2021).

Practically, these results offer actionable guidance for real estate stakeholders in Lagos and similar markets. Essentially, location (0.317) and property identity (0.284) signal to brokers and developers that prime sites with strong branding potential command premium value, surpassing price considerations (0.128). Besides, property investors should prioritize properties tailored to certain operational needs (0.189),

while business owners are encouraged to leverage experience (0.293) to navigate volatility (0.379), rather than over-relying on financial literacy (0.109) in data-scarce scenarios.

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Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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