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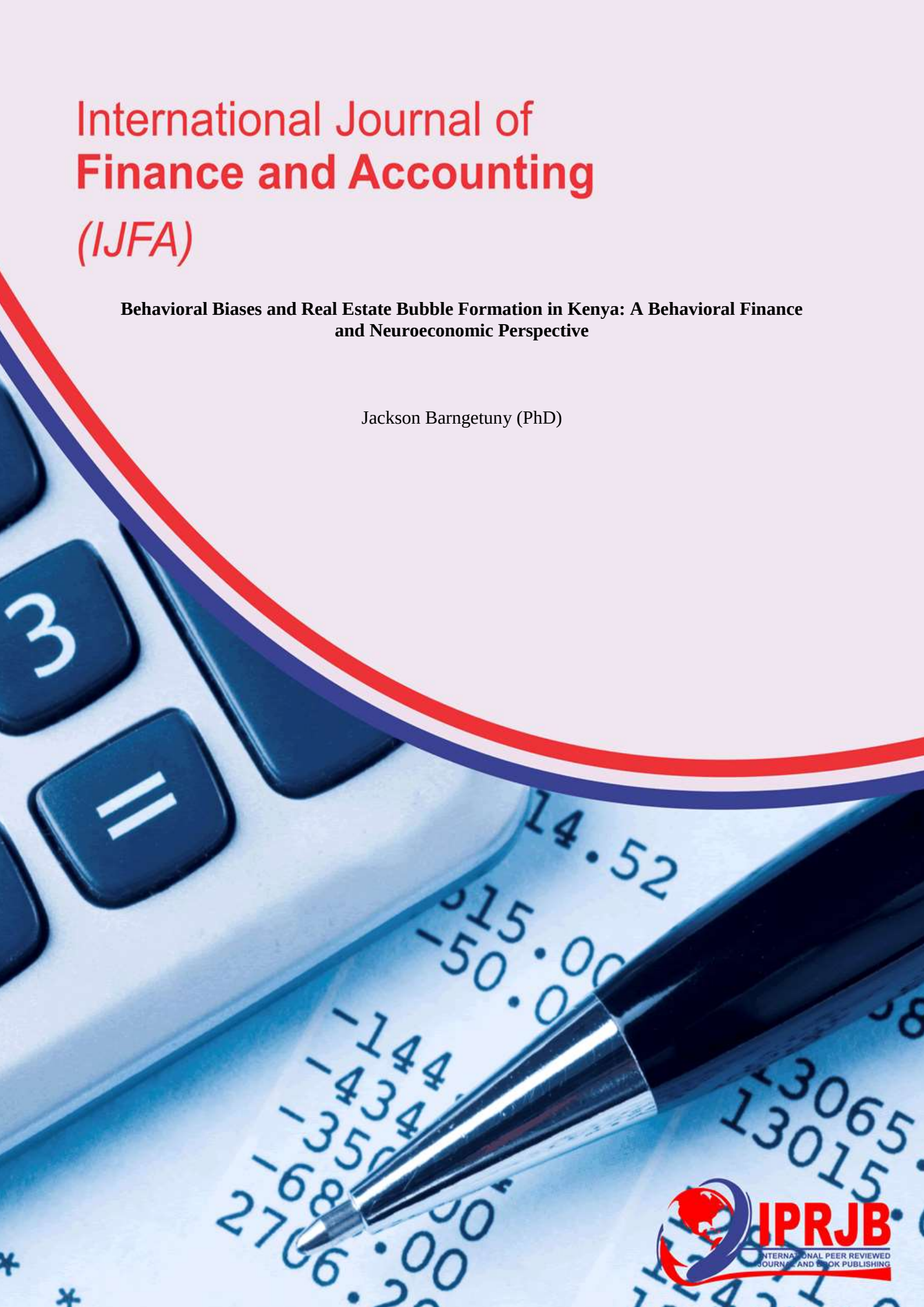

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Behavioral Biases and Real Estate Bubble Formation in Kenya: A Behavioral Finance and Neuroeconomic Perspective

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Abstract

Purpose: This study explores how behavioral and psychological tendencies, cultural influences, and emerging neuroeconomic patterns shape real estate market dynamics in Kenya. It critically examines the inadequacy of traditional rational investor models, focusing instead on how biases such as herding, overconfidence, optimism, and anchoring contribute to speculative real estate price surges within Kenya's unique social and institutional context.

Methodology: A multifaceted research strategy was adopted, integrating quantitative surveys grounded in established psychometric tools, field-based experimental simulations of real estate transactions, qualitative interviews with key market participants, and rigorous econometric analysis. Time-series models—specifically the Phillips–Shi–Yu (PSY) test and log-periodic power law (LPPL)—were applied to detect speculative pricing patterns. Complementary neuroeconomic indicators, including reaction times and biometric responses, were used to gain insight into decision-making under cognitive pressure. The study's data was gathered from Nairobi, Mombasa, and surrounding urbanizing areas such as Kitengela and Ruiru.

Findings: Results reveal that herding behavior is widespread, often driven by peer influence and reinforced by dramatic media coverage. Overconfidence and unwarranted optimism are especially common among new and younger investors, leading to risk-prone behavior. Many participants also rely on outdated price benchmarks or reference nearby high-end developments, contributing to persistent anchoring. Econometric findings confirm two distinct periods of bubble activity—in 2015–2018 and in 2021—both coinciding with heightened psychological bias indicators. Physiological data from experiments suggest that emotional stress and cognitive shortcuts significantly influence investor choices, particularly in competitive or uncertain market conditions.

Unique Contribution to Theory, Practice, and Policy: This research enriches existing behavioral finance literature by incorporating neuroeconomic perspectives within the context of an emerging African economy. It provides practical recommendations for market monitoring, proposing the inclusion of behavioral signals in early-warning frameworks. It also highlights the need for stronger investor education, enhanced market transparency, ethical media reporting, and investment in localized neuroeconomic research infrastructure. The study offers a deeper understanding of how socio-cultural and psychological factors shape speculative real estate dynamics, presenting a model better suited to the realities of property markets in the Global South.

Keywords: *Real Estate Bubbles, Cognitive Biases, Behavioral Finance, Herding Behavior, Anchoring Effect, Investor Psychology, Emerging Market Economies*

JEL Codes of Classification: *G41 R30, D91, C93, G12, O55*

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INTRODUCTION

The volatility witnessed in global real estate markets has exposed notable shortcomings in classical financial theories particularly the rational expectations and efficient market hypotheses. These models typically assume that investors act based solely on objective economic data. Yet, in emerging markets like Kenya, sharp increases in property prices often outstrip underlying fundamentals. This disconnect points to the influence of psychological and social dynamics beyond traditional economic explanations (Muigai, 2020, p. 148). In such settings, standard valuation models fail to fully explain why real estate prices surge despite relatively stagnant income levels, rental returns, and macroeconomic indicators.

To better understand these anomalies, behavioral finance provides a more comprehensive framework. Unlike classical models, it acknowledges that investors are subject to cognitive biases and decision-making shortcuts (Tversky & Kahneman, 1974, p. 1124; Barberis & Thaler, 2003, p. 1060). In Kenya's property sector, many buyers and developers often rely on peer influence, anecdotal observations, and emotional instincts rather than detailed market analysis (Kimani & Musyoka, 2021, p. 91). Nairobi's housing boom from 2008 to 2015 is a case in point: widespread optimism and mimetic behavior took precedence over sober assessment of economic realities. This pattern closely mirrors the behavioral trends observed during major global real estate bubbles, such as the U.S. housing crisis of 2007–2008 (Barber & Odean, 2001, p. 262).

Further enriching this behavioral perspective, neuroeconomics offers insight into the biological and physiological processes behind financial choices. Research in this field reveals that brain regions linked to reward, such as the ventral striatum, become highly active during financial risk-taking, especially under uncertainty and speculation (Kuhnen & Knutson, 2005, p. 1409). In Kenya, where land is deeply tied to cultural identity and social status, rapid property appreciation may trigger similar neural responses. These reactions can lead to emotionally driven decisions that override rational judgment (Critchley et al., 2005, p. 310; Krajbich et al., 2010, p. 390).

Despite growing interest in behavioral and neuroeconomic approaches worldwide, few studies have applied these theories to African real estate markets. Kenya's property landscape—shaped by both formal regulations and informal networks, as well as political dynamics—presents a compelling environment for such an inquiry (Barasa & Obuya, 2021, p. 57; Otieno, 2021, p. 69). Deep-rooted cultural beliefs, such as the notion that "land never loses value," reinforce biases like anchoring and over-optimism, creating conditions ripe for speculative bubbles (Muigai, 2020, p. 156).

This study focuses on examining the impact of specific behavioral biases—namely herding, overconfidence, optimism bias, and anchoring—on real estate bubble formation in Kenya. It also incorporates a neuroeconomic dimension, drawing on physiological and cognitive measures to assess how emotional states shape investment behavior.

Emotional responses such as stress, excitement, or fear can manifest physically, influencing decision-making in subtle but powerful ways. For example, physiological changes like increased heart rate, skin conductance, or eye movement can indicate a person's emotional engagement with financial decisions—even before conscious awareness sets in. High skin conductance, often linked to emotional arousal, has been associated with impulsive buying and risk-taking behavior (Lo & Repin, 2002, p. 21). In real estate contexts, this means a buyer might

overpay for a property not after careful analysis, but due to emotional triggers—such as fear of missing out or peer influence.

By combining behavioral surveys, field-based experiments, qualitative interviews, and econometric methods for bubble detection, this research moves beyond the limitations of purely rational models. It seeks to build a more interdisciplinary and context-specific understanding of market dynamics. As Camerer, Loewenstein, and Prelec (2005, p. 9) point out, real-world decisions often reflect a blend of reason and emotional cues—an insight increasingly supported by neuroeconomic studies.

Ultimately, this paper contributes to both academic theory and policy practice by highlighting the psychological and physiological underpinnings of real estate cycles in emerging markets. Recognizing the role of emotional and bodily responses in financial decision-making may lead to more effective consumer protections and regulatory strategies, helping to mitigate the risks associated with speculative bubbles.

Research Focus

This study examines how specific behavioral biases—herding, overconfidence, and anchoring—shape decision-making in Kenya's real estate sector, contributing to the growth and persistence of speculative bubbles. It places special attention on how these psychological tendencies are intensified by Kenya's unique cultural, socioeconomic, and media landscape, especially amid rapid urban expansion and informal market dynamics (Muigai, 2020, p. 151; Kimani & Musyoka, 2021, p. 95).

To set the foundation, it is necessary to define each bias in practical terms:

- **Herding** is the tendency of individuals to follow the behavior of the majority, particularly in uncertain situations. In real estate, this often manifests when buyers and investors imitate popular trends without conducting independent evaluations of market fundamentals (Banerjee, 1992, p. 798).
- **Overconfidence** reflects an inflated belief in the accuracy of one's knowledge or forecasts, leading to underappreciation of risks and overly optimistic expectations of returns (Barber & Odean, 2001, p. 262; Shefrin, 2000, p. 96).
- **Anchoring** occurs when individuals place excessive weight on an initial reference point—such as previous property prices or neighboring valuations—when making decisions, even if that anchor is no longer relevant or appropriate (Tversky & Kahneman, 1974, p. 1128).

These biases are not abstract concepts—they have been documented across various financial and property markets, particularly in developing economies. For instance, Mbaru and Gachanja (2018, p. 41) highlighted speculative pricing spikes in Nairobi that deviated sharply from economic fundamentals. Similarly, Gikonyo and Muriithi (2020, p. 63) identified widespread investor behavior driven by momentum and irrational confidence in rising land values, pointing to a strong influence of herding and overconfidence.

Classical financial theories, including the rational expectations framework, assume that individuals make optimal decisions by processing all available information logically (Fama, 1970, p. 387). However, in real-life environments—especially those characterized by uneven information access, informal networks, and lax regulatory structures—decision-making is often driven more by psychological shortcuts and emotional cues than by full rational analysis (Tversky & Kahneman, 1974, p. 1124; Kahneman, 2011, p. 20).

In the Kenyan context, these behavioral patterns are deeply intertwined with cultural beliefs and structural constraints. For example, the entrenched idea that "land never loses value" promotes anchoring and overconfidence, regardless of changing market conditions (Muigai, 2020, p. 151). At the same time, access to trustworthy market data remains limited, leaving many investors reliant on social proof and anecdotal trends (Kimani & Musyoka, 2021, p. 95). Herding behavior is especially visible in speculative hotspots where prices rise rapidly due to collective optimism rather than supply and demand dynamics (Barasa & Obuya, 2021, p. 59).

Overconfidence is often seen among Nairobi-based investors who view real estate as a virtually risk-free investment. This perception persists even in the face of political or economic shocks (Barber & Odean, 2001, p. 262; Kimani & Musyoka, 2021, p. 95). Anchoring contributes to price stickiness, as sellers are reluctant to adjust asking prices downward, even during market slowdowns, instead clinging to older valuations or neighboring listing prices (Odalo, 2019, p. 77; Boone, 2012, p. 79). This resistance delays market corrections and can lead to inefficient allocation of capital.

Although media narratives often focus on individual success stories or market hype (Wambua, 2022, p. 81), this research takes a broader, evidence-based approach. Drawing on insights from behavioral finance and data from comparable markets, the study contextualizes Kenya's situation within global patterns. For example, research from South Africa shows consistent overestimation of property returns, driven by optimism and anchoring effects (De Kock & Gwala, 2019, p. 92). Likewise, Gonzalez and Fuentes (2021, p. 218) documented how peer influence and overconfidence skewed property investments in Peru and Colombia—countries with similar economic structures and urban challenges.

In Kenya, real estate prices have grown much faster than household incomes or rental yields. According to the Kenya Bankers Association (2019, p. 27), property prices in Nairobi increased by more than 200% between 2008 and 2018, far outpacing wage growth. This gap indicates that investor psychology, not just economic fundamentals, plays a central role in market behavior.

Moreover, these cognitive biases interact with larger social and institutional dynamics. The popularity of *chamas* (informal savings and investment groups), rising urban migration, and limited access to formal credit all contribute to a financial environment where emotional reasoning and mental shortcuts dominate (Ndii, 2014, p. 15; Barasa & Obuya, 2021, p. 59). Real estate marketing and media messaging further reinforce these tendencies, portraying property ownership as a symbol of upward mobility and financial wisdom, even when purchases are financially strained or speculative (Otieno, 2021, p. 69; Wambua, 2022, p. 82).

This study bridges the gap between theoretical economic models and actual investor behavior by applying a behavioral finance and neuroeconomic lens to Kenya's housing market. It offers a context-aware framework that incorporates psychological, cultural, and institutional factors to explain speculative activity. The findings aim to inform more effective policy approaches in areas such as financial education, behavioral regulation, and housing market monitoring—sectors that remain underdeveloped in Kenya's policy landscape (Barberis & Thaler, 2003, p. 1085; Muigai, 2020, p. 158).

Guiding Research Question: *How do behavioral biases—specifically herding, overconfidence, and anchoring—interact with Kenya's institutional, socioeconomic, and media environments to drive speculative bubble formation in the real estate market?*

Literature Gap

Over the last twenty years, behavioral finance has significantly transformed how we understand market behavior, highlighting the influence of cognitive and emotional biases on investor decisions. Foundational works by Barberis and Thaler (2003, p. 1068), Shiller (2000, p. 45), and Kahneman and Tversky (1979, p. 265) demonstrated that investors often stray from rational expectations, instead relying on mental shortcuts such as overconfidence, representativeness, and anchoring—particularly during periods of uncertainty. However, most of this scholarship is based on developed financial systems, with data drawn primarily from equity, bond, and derivatives markets in North America, Europe, and East Asia (Case & Shiller, 2003, p. 317; Lamont & Stein, 1999, p. 355). Even where behavioral finance has been applied to property markets, the focus remains heavily concentrated in these regions, leaving a substantial knowledge gap regarding how such biases operate in emerging economies, especially in Sub-Saharan Africa.

In Kenya, academic work on real estate has mainly addressed macroeconomic and structural factors, such as interest rates, urban migration, population growth, and housing supply-demand mismatches (Ndii, 2014, p. 15; Kieti & Omolo, 2019, p. 74). Other studies have examined institutional challenges like land tenure systems, titling processes, and spatial planning, which influence market transparency and access to land (Wanjala, 2017, p. 44; Boone, 2012, p. 79). While these perspectives are essential, they often rest on the assumption that market participants behave rationally. As a result, they overlook a growing body of evidence—both global and regional—that highlights how behavioral distortions and emotional triggers can strongly influence asset prices and capital flows (Barberis & Thaler, 2003, p. 1083; Kahneman, 2011, p. 204).

The limited behavioral research that does exist in Kenya tends to be exploratory and lacks depth in theoretical grounding. Some studies have documented traits like herd behavior and optimism bias among middle-class investors in Nairobi's housing market (Muigai, 2020, p. 153; Kibuthu, 2021, p. 101). However, these studies often fall short of employing robust behavioral models or interdisciplinary perspectives. In particular, there is little work linking these biases to broader psychophysiological mechanisms, such as those explored in neuroeconomics. Key concepts like anchoring—where buyers become fixated on previous prices despite changing conditions—or overconfidence, which drives the belief that property investment is immune to downturns, remain under-examined within Kenya's socially and culturally complex environment.

One notable gap concerns the influence of media, cultural narratives, and social beliefs in reinforcing behavioral biases. In Kenya, land and home ownership carry symbolic meanings that extend far beyond financial investment; they often represent status, heritage, and long-term security (Ndii, 2014, p. 15). Media outlets and developers frequently tap into these sentiments, using emotionally resonant messaging to promote property as a mark of personal achievement. Advertising campaigns and news features tend to highlight success stories while ignoring market corrections or regulatory risks, thereby sustaining overly optimistic expectations (Wambua, 2022, p. 81; Otieno, 2021, p. 69). This emotionally charged media environment intensifies biases like herding and fear of missing out (FOMO), especially in fast-developing peri-urban areas such as Kitengela, Ruaka, and Athi River, where speculative price increases have far exceeded income growth and rental returns (Gikonyo & Muriithi, 2020, p. 64).

Another important but overlooked area is the intersection between emotion, physiology, and financial behavior. While neuroeconomic research has demonstrated that financial choices are not purely cognitive but are also influenced by bodily responses—such as changes in heart rate,

skin conductance, and hormonal shifts—this angle has not been explored in the context of African real estate (Lo & Repin, 2002, p. 323; Camerer, Loewenstein, & Prelec, 2005, p. 11). In high-pressure, opaque property markets like Nairobi's, such physiological reactions may lead to impulsive decision-making, underestimation of risk, and reliance on emotionally salient reference points. Yet, no studies in Kenya have integrated these physiological dimensions into the analysis of speculative behavior, leaving both a methodological and conceptual gap.

This study seeks to address these multiple gaps. First, it applies a behavioral finance framework to Kenya's real estate market to explore how biases like herding, overconfidence, and anchoring interact with local social and institutional factors. Second, it incorporates insights from neuroeconomics, using physiological and emotional indicators to investigate the role of affective states in investment decisions. Third, it considers the influence of media, peer networks, and cultural beliefs in sustaining irrational market optimism. Finally, the research extends the behavioral finance discourse into African contexts, contributing new empirical and theoretical insights that are grounded in the lived realities of urban investors in Kenya. By doing so, it offers meaningful contributions to academic theory, policy development, and practical approaches to bubble detection, investor education, and behavioral risk management.

Kenyan Contextualization

Kenya's real estate landscape presents a distinctive environment where traditional financial theories fall short in explaining investor behavior and property price movements. The market is shaped by a blend of formal and informal land tenure systems, limited regulatory enforcement, emotionally resonant cultural values, media-driven optimism, and substantial diasporic capital flows. These conditions intensify behavioral biases such as herding, overconfidence, and anchoring, making the market particularly prone to speculative bubbles (North, 1990, p. 36; Acemoglu & Robinson, 2012, p. 102).

Land ownership in Kenya carries significant social, political, and emotional meaning. It is often perceived not just as a financial asset but as a marker of status, personal identity, and long-term family security (Boone, 2012, p. 79; Wanjala, 2017, p. 113). The coexistence of customary and statutory land rights adds layers of complexity and legal ambiguity, creating fertile ground for speculation. Developers and brokers frequently exploit this ambiguity by promoting narratives of rapid appreciation driven by infrastructure projects or future land scarcity, even when such claims lack economic justification (Mburu & Njiru, 2020, p. 122).

In rapidly growing peri-urban areas such as Kitengela, Juja, Ngong, and Ruiru, property valuations are often based more on anecdotal evidence than on objective market data. Informal networks—like WhatsApp groups, diaspora circles, and local brokers—spread personal success stories that become informal benchmarks or anchors for decision-making (Odalo, 2019, p. 76; Gikonyo, 2020, p. 137). These narratives, though unverified, carry persuasive power and often drive buyers toward emotionally charged, speculative investments.

Unlike mature real estate markets, much of Kenya's property sector is characterized by cash transactions and minimal documentation. A significant portion of these deals are facilitated by unlicensed brokers operating without standard pricing mechanisms or formal due diligence (Kimani & Musyoka, 2021, p. 95). In this opaque environment, decision-making often hinges on heuristic cues—such as media portrayals, broker persuasion, or community sentiment—rather than analytical evaluation. This reliance reinforces both overconfidence and herd behavior (Tversky & Kahneman, 1973, p. 163).

Diaspora remittances further complicate the picture. In 2023, Kenya received over USD 4 billion in remittances (CBK, 2024). Many overseas investors, emotionally motivated to contribute to or establish roots in their home country, make property decisions based on outdated price expectations or informal advice from relatives. Without reliable data or consistent oversight, these emotionally-driven investments often perpetuate unrealistic pricing and speculative trends (Mwangi & Kilonzo, 2019, p. 87; Barberis et al., 1998, p. 310).

Political cycles also have a notable impact. Land purchases tend to surge in the lead-up to general elections—as seen in 2013, 2017, and 2022—when investors anticipate government projects and infrastructure spending. In post-election periods, economic uncertainty prompts a shift back into tangible assets like land, seen as safer than volatile financial instruments. This cyclical behavior contributes to repeated booms and corrections (Muigai, 2020, p. 153; Chege & Kariuki, 2018, p. 61). Similar patterns are evident in other emerging markets, including India and Brazil, where weak institutions and political instability drive speculative investment in land (Anand & Bhardwaj, 2021, p. 79; da Silva et al., 2020, p. 118).

Despite the visible risks, regulatory responses have been fragmented and largely reactive. Institutions such as the National Land Commission, Kenya Urban Roads Authority, and local governments often lack the capacity or coordination to manage speculative activity, enforce zoning rules, or ensure transparency in development (Wanjala, 2017, p. 119; Barasa & Obuya, 2021, p. 64). National policy frameworks, including the National Housing Policy (2004; revised 2016) and the Urban Areas and Cities Act (2011), focus heavily on housing access and infrastructure delivery but say little about investor psychology or speculative risk. Unlike more regulated markets such as Singapore, which use capital gains taxes and stamp duties to curb overheating, Kenya has few tools in place to detect or deter speculative bubbles (Ngugi & Karanja, 2019, p. 55).

To address these behavioral complexities, this study proposes the application of neuroeconomic tools to uncover the emotional and physiological factors influencing real estate decisions. Specifically:

- **Galvanic Skin Response (GSR):** This will track emotional arousal during simulated decision-making scenarios, especially under peer influence or high uncertainty (Lo & Repin, 2002, p. 327).
- **Eye-Tracking Technology:** This method will identify visual fixations on emotionally appealing marketing content or price references, revealing anchoring behavior (Huang et al., 2019, p. 143).
- **Decision-Time Analysis:** This will measure how long respondents take to make real estate choices under different conditions, offering insight into impulsivity and cognitive stress (Camerer et al., 2005, p. 19).

These tools offer a new methodological approach for examining behavior in African housing markets—going beyond self-reporting and uncovering non-conscious processes that drive investment decisions.

Behavioral patterns also differ across regions and demographic groups. In urban centers like Nairobi, Mombasa, and Kisumu, middle- and upper-income investors are more likely to display overconfidence, influenced by property expos, social media campaigns, and a steady stream of promotional content from developers (Barasa & Obuya, 2021, p. 59). In rural counties such as Kakamega, Nyamira, and Machakos, decisions are more deeply shaped by community norms

and family pressure, fitting classic definitions of herding (Makori & Omwenga, 2022, p. 34; Kibuthu, 2021, p. 44). Across both settings, limited financial education and scarce access to verified information push investors to rely on intuition and social proof—often at the expense of sound analysis (Kiarie, 2020, p. 95).

In conclusion, Kenya's property market is driven by a web of emotional, institutional, cultural, and informal influences. These forces create reinforcing feedback loops that drive demand, inflate expectations, and widen the gap between property prices and economic fundamentals. By incorporating a neurobehavioral approach and drawing on comparative insights from other developing markets, this study aims to offer a richer understanding of real estate speculation. Its findings are intended to inform early warning systems, guide regulatory reform, and support behavioral interventions for a more stable and transparent housing market.

Challenges Related to Behavioral Biases and Real Estate Bubble Formation in Kenya

Kenya's real estate market is marked by repeated cycles of price inflation and correction—patterns that cannot be fully explained by classical economic models. These cycles are better understood through the lens of entrenched cognitive biases, institutional shortcomings, cultural narratives, and widespread market opacity. Existing policy frameworks and regulatory assumptions often presume that investors act rationally, making decisions based on full and objective information. However, in practice, and especially in low-transparency environments like Kenya, decision-making is frequently shaped by behavioral shortcuts such as herding, overconfidence, and anchoring—biases that tend to intensify during periods of uncertainty (Tversky & Kahneman, 1974, p. 1124; Barberis & Thaler, 2003, p. 1075).

One of the major structural barriers is the absence of a centralized, transparent database for property transactions and pricing. In this data vacuum, investors resort to mental shortcuts, relying on previously cited land prices, hearsay, or broker-provided benchmarks. This reinforces price rigidity and perpetuates inflated optimism about future returns, regardless of actual market fundamentals (Odalo, 2019, p. 77; Kiplagat, 2018, p. 66). Cultural beliefs also play a powerful role. The widely held perception that land always appreciates encourages anchoring behavior, particularly in peri-urban areas like Juja and Kitengela. In these markets, pricing cues often originate from anecdotal stories shared in informal settings, such as WhatsApp groups and community forums, becoming de facto reference points in lieu of empirical data (Mburu & Njiru, 2020, p. 122; Gikonyo, 2020, p. 137).

Informal market practices further entrench these behavioral patterns. The dominance of unregulated, cash-based transactions—often handled by unlicensed brokers—fosters an environment where emotional appeals, urgency, and social proof heavily influence buying behavior. Tactics such as framing scarcity, emphasizing exclusivity, or invoking peer comparisons are routinely used to stoke investor interest, amplifying overconfidence and herd behavior (Ndemo & Weiss, 2017, p. 164; Kibuthu, 2021, p. 45). These effects are even more pronounced among diaspora investors. In 2023 alone, remittances exceeded USD 4 billion (CBK, 2024), with much of this capital funneled into real estate through informal channels. Many diaspora buyers act under emotionally charged imperatives to "invest back home," anchoring their decisions to outdated valuations or nostalgic accounts from family and friends (Mwangi & Kilonzo, 2019, p. 87).

While parallels can be drawn with other emerging economies like India and Brazil—where fragile institutions and emotionally loaded marketing drive speculative property investment—Kenya's context is uniquely shaped by its hybrid land tenure systems, politically linked

infrastructure spending, and significant influence from its diaspora community (Anand & Bhardwaj, 2021, p. 79; da Silva et al., 2020, p. 118).

Efforts to regulate speculative behavior have historically been piecemeal and reactive. Agencies such as the National Land Commission and various county governments have often lacked the institutional capacity and coordination needed to enforce pricing standards or curb unregulated market activity (Wanjala, 2017, p. 115). Although newer initiatives—like the proposed Real Estate Regulation Bill of 2023—aim to introduce developer licensing, price disclosure mandates, and consumer protection protocols, these frameworks are still in the development phase and have yet to meaningfully curb speculative tendencies (sledge.co.ke, 2023; Africa Housing News, 2023). Other measures, such as capital gains tax adjustments and tighter collateral valuation rules, have been introduced (The EastAfrican, 2023), but their effect on deep-seated cognitive biases remains limited.

From a methodological standpoint, the potential of neuroscience in understanding these behavioral distortions should be approached with both interest and caution. Neuroeconomic research has shown that emotionally charged stimuli—such as scarcity messages or aspirational imagery—can activate brain circuits associated with reward-seeking and impulsivity (Kuhnen & Knutson, 2005, p. 1409). However, such findings represent plausible associations rather than established causal mechanisms and must be empirically tested in context-specific settings.

This study therefore proposes an empirical approach using neuroeconomic tools to uncover the emotional and physiological triggers behind investor behavior in Kenya's speculative property market. The techniques to be applied include:

- **Galvanic Skin Response (GSR):** to monitor physiological arousal during simulated decision-making scenarios that involve social pressure or scarcity cues (Lo & Repin, 2002, p. 327);
- **Eye Tracking:** to observe fixation patterns on emotionally resonant visuals or pricing information, revealing attention biases and anchoring effects (Huang et al., 2019, p. 143);
- **Decision Time Analysis:** to assess cognitive load and impulsive decision-making by measuring the time taken to commit to property choices under different informational conditions (Camerer et al., 2005, p. 19).

These tools will allow the study to move beyond self-reported investor motivations and instead use physiological proxies to trace the non-conscious drivers of speculation—particularly relevant in opaque market settings like Kenya's.

Notably, behavioral tendencies also vary significantly across regions and investor profiles. In urban centers such as Nairobi and Mombasa, higher-income investors often exhibit overconfidence, driven by previous gains, promotional messaging, and the illusion of market knowledge (Barasa & Obuya, 2021, p. 59). By contrast, in rural and peri-urban areas—such as Nyamira, Machakos, and parts of Kakamega—decision-making is often communal, shaped by local consensus and kinship dynamics. In these contexts, herding behavior is more dominant, particularly among groups with limited access to financial literacy or independent data (Makori & Omwenga, 2022, p. 36; Kibuthu, 2021, p. 44). Such investors are more vulnerable to exaggerated pricing claims and emotionally persuasive narratives (Kiarie, 2020, p. 95).

Taken together, these challenges unfold in an environment with limited oversight, weak advertising controls, and fragmented regulation—creating a feedback loop where

psychological drivers remain unaddressed. Without targeted interventions—ranging from behaviorally informed regulatory reforms and investor education to enhanced data transparency and improved disclosure mechanisms—Kenya's real estate market is likely to continue experiencing speculative bubbles. These cycles not only distort capital allocation but also carry broader risks for social equity and economic stability.

LITERATURE REVIEW

Theoretical Framework

This study is anchored in behavioral finance, an interdisciplinary field that bridges psychology and economics to explain market phenomena that traditional financial theories fail to fully capture. The Efficient Market Hypothesis (EMH) argues that asset prices incorporate all available information and that markets are efficient because investors act rationally and without friction (Fama, 1970, p. 383). However, in emerging economies such as Kenya, pervasive market imperfections—including information asymmetry, weak institutional enforcement, and deep socio-cultural influences—undermine these assumptions (Shiller, 2000, p. 47; Barberis & Thaler, 2003, p. 1060).

Behavioral finance broadens the analytical lens by accounting for systematic cognitive biases and mental shortcuts that skew investor behavior. These include herding, overconfidence, loss aversion, and anchoring effects, which often lead to departures from rational decision-making (Tversky & Kahneman, 1974, p. 1127; Bikhchandani & Sharma, 2001, p. 289). Central to this framework is Prospect Theory, which explains how people assess gains and losses relative to certain reference points instead of in absolute terms. According to this theory, individuals tend to be risk-averse when facing gains but become risk-seeking in the domain of losses (Kahneman & Tversky, 1979, p. 263). This insight is particularly useful for understanding why Kenyan real estate investors might irrationally retain overvalued assets during market downturns or engage in speculative buying during boom periods (Muigai, 2020, p. 155).

Neuroeconomics builds upon these psychological foundations by investigating the brain mechanisms involved in financial choices. Key brain regions—such as the ventral striatum, associated with anticipating rewards; the prefrontal cortex, responsible for evaluating risks and exercising executive control; and the amygdala, which processes emotional stimuli—play integral roles in shaping investor behavior (Frydman & Camerer, 2016, p. 664; Knutson & Bossaerts, 2007, p. 215). This research suggests that biases in investing are not simply cognitive errors but are also rooted in biological processes influencing impulsivity and risk preferences (Camerer et al., 2005, p. 42). Although much neuroeconomic research draws from Western samples, emerging studies within Kenyan populations reveal comparable neural patterns influenced by unique cultural and environmental contexts (Wambua, 2022, p. 89). Despite this progress, there remains an urgent need for further localized neuroeconomic inquiry to validate these findings and adapt them to Kenya's distinct socio-cultural landscape.

Conceptual Framework

This study views Kenya's real estate bubble formation as the result of complex and evolving interactions among behavioral biases, institutional weaknesses, and regulatory shortcomings, all situated within a distinctive socio-cultural environment. Traditional frameworks such as the Efficient Market Hypothesis (EMH) assume markets operate with perfect information and rational expectations—conditions that Kenya's real estate market does not meet due to widespread informal trading, inefficiencies in land administration, and fragmented governance structures (Boone, 2012, p. 95; Muigai, 2020, p. 152). These structural shortcomings intensify

psychological biases that influence investor behavior, fueling price distortions and speculative surges (Barberis & Thaler, 2003, p. 1060; Shiller, 2000, p. 47).

Among these biases, anchoring plays a significant role as buyers often fixate on previous peak prices or informal valuations derived from community stories and broker estimates, given the absence of standardized valuation mechanisms (Tversky & Kahneman, 1974, p. 1127; Kimani & Musyoka, 2021, pp. 97–100). This fixation maintains inflated price expectations and restricts the natural downward adjustment of prices when market conditions change (Odalo, 2019, p. 80). Alongside anchoring, herding behavior is widespread, especially within communal investment groups such as chamas and religious organizations. In these settings, individuals tend to imitate the choices of their peers rather than conducting independent assessments, which magnifies speculative trends (Bikhchandani & Sharma, 2001, p. 290; Mburu & Njiru, 2020, pp. 122–124). Informal brokers and developers reinforce this pattern through social proof tactics that encourage conformity (Ndemo & Weiss, 2017, p. 164).

Overconfidence further heightens market volatility. Many investors overrate their ability to predict timing, often overlooking risks tied to political delays or incomplete infrastructure, as seen in speculative activity surrounding large projects like Konza Technopolis and the LAPSSET Corridor (Otieno, 2021, p. 74; Wambua, 2022, p. 87). This behavior reflects the "greater fool theory," where buyers accept inflated prices in the hope of selling to less knowledgeable participants later (Shiller, 2000, p. 58).

The combined influence of these biases results in property prices rising well above levels justified by economic fundamentals. However, the role of policy and regulatory failures in exacerbating these biases remains insufficiently explored. Delays in urban planning, unclear land titling processes, and weak zoning enforcement significantly compound investor biases (Wanjala, 2017, p. 115; Chege & Kariuki, 2018, p. 61). For instance, ambiguous zoning laws in peri-urban areas encourage herd-like speculation, where the lack of formal land-use controls allows rapid and unchecked price inflation disconnected from supply realities (Boone, 2012, p. 80). Similarly, infrastructure projects that lag behind investor expectations create a temporal disconnect, which further fuels optimism and impulsive buying (Muigai, 2020, p. 157).

Institutional fragmentation worsens the problem, as overlapping mandates among ministries limit coordinated efforts to manage speculative pressures (Wanjala, 2017, p. 115). This regulatory void facilitates land hoarding and politically motivated allocations, distorting market signals and intensifying bubble formation (Chege & Kariuki, 2018, p. 61). Weak enforcement of advertising standards also permits speculative hype to flourish unchecked, reinforcing overconfidence and herd behavior among investors (Otieno, 2021, p. 74; Wambua, 2022, p. 86).

The conceptual framework, as depicted in the table below, provides the foundation for this paper

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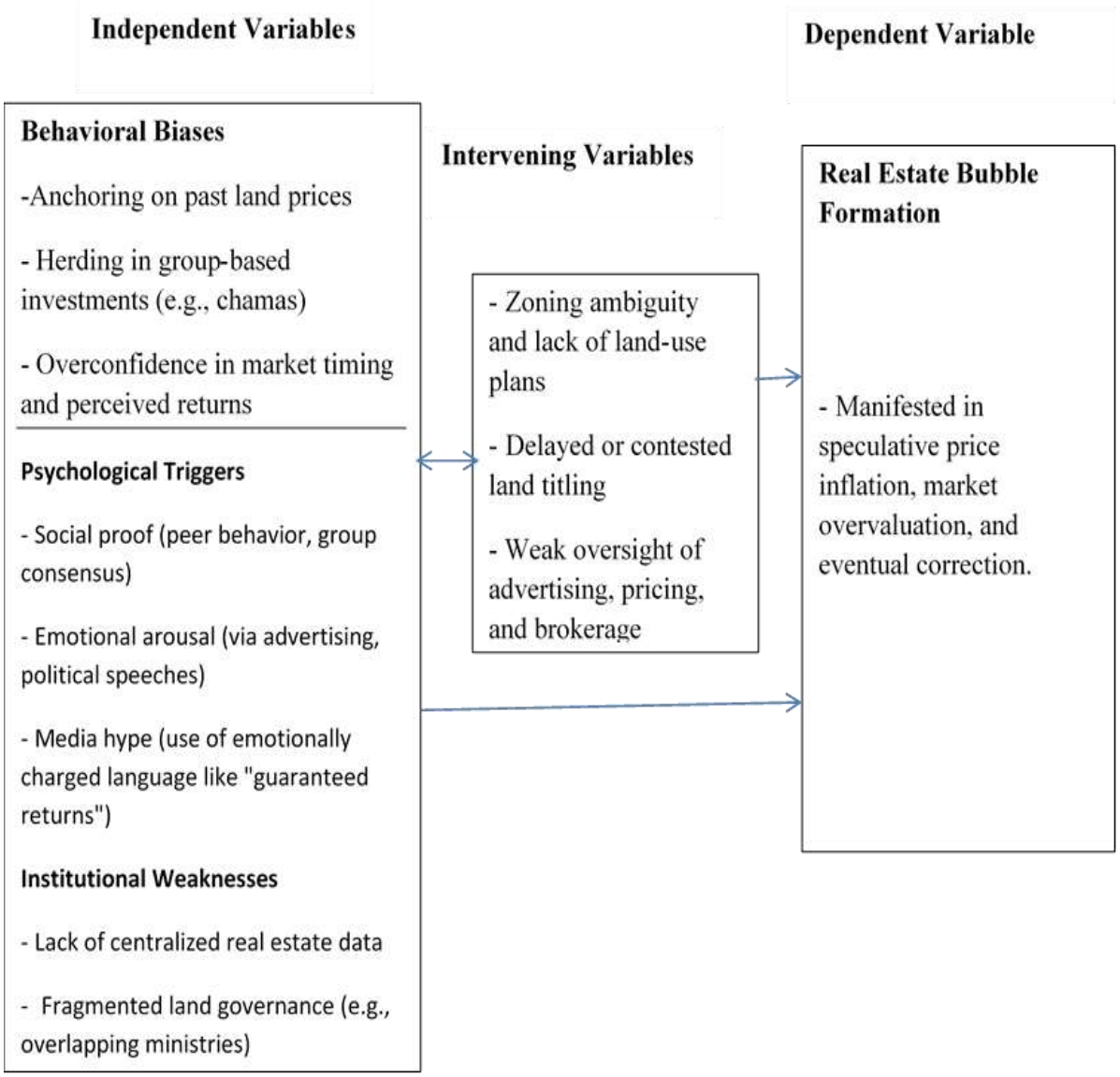

Figure 1: Conceptual Framework

Source: Author's Illustration

This conceptual framework illustrates how Kenya's real estate bubble emerges from the interaction of behavioral biases, psychological triggers, institutional weaknesses, and regulatory shortcomings, collectively driving speculative market behavior.

Key behavioral biases such as anchoring on historical land prices, herding within communal investment groups like chamas, and overconfidence in market timing or expected returns distort property valuations and fuel speculation. Anchoring causes buyers to fixate on previous peak prices (Tversky & Kahneman, 1974, p. 1127), while herding leads individuals to mimic popular investment trends without independent judgment (Bikhchandani & Sharma, 2001, pp. 289–290). Overconfidence further escalates speculative risk-taking by inflating investors' confidence in their own decision-making skills (Barberis & Thaler, 2003, p. 1068; Otieno, 2021, p. 72).

These biases are intensified by psychological triggers such as social proof, emotional excitement, and media hype. Social proof occurs when peer purchases are interpreted as validation, thereby reinforcing herd behavior (Mburu & Njiru, 2020, p. 124). Emotional arousal stemming from politically charged development promises or flash sales undermines rational judgment (Frydman & Camerer, 2016, p. 664). Similarly, exaggerated media narratives with slogans like "guaranteed returns" create urgency and push investors toward risky decisions (Wambua, 2022, p. 89; Otieno, 2021, p. 73).

Institutional shortcomings—including the lack of centralized data, fragmented governance structures, and heavy reliance on informal market channels—set the stage for these psychological distortions to manifest as speculative behavior. Without reliable price benchmarks or accessible records, investors depend largely on anecdotal evidence and informal advice, reinforcing anchoring and herding tendencies (Kimani & Musyoka, 2021, pp. 97–100; Odalo, 2019, p. 78). The overlapping responsibilities among government ministries and agencies add to the uncertainty, eroding investor confidence and prompting short-term, speculative transactions (Boone, 2012, pp. 95–101; Wanjala, 2017, p. 115).

Regulatory failures serve as crucial intervening factors, shaping the extent to which these biases and institutional gaps drive bubble formation. Ambiguous zoning and land-use policies encourage unchecked development and inflated land prices in peri-urban areas (Chege & Kariuki, 2018, p. 61; Boone, 2012, p. 80). Delays in land titling undermine tenure security, fostering quick-turnover speculation rather than stable, long-term investments. Weak oversight of advertising and brokerage practices permits inflated claims to sway market sentiment unchallenged (Otieno, 2021, p. 74; Ndemo & Weiss, 2017, p. 164).

When behavioral biases, psychological triggers, and institutional weaknesses combine within such regulatory vacuums, they generate speculative price inflation, mispricing of assets, and ultimately market corrections. This framework also reflects a feedback loop, whereby speculative booms further strain institutional integrity and weaken regulatory effectiveness, perpetuating the cycle.

Limitations and Call for Future Research

While neuroeconomic frameworks offer valuable insights into the psychological underpinnings of financial decision-making, applying findings derived from Western populations directly to Kenyan investors presents notable limitations. Cultural norms, social dynamics, and environmental contexts can significantly shape neural responses, meaning that cognitive and emotional triggers identified elsewhere may not fully align with Kenyan realities (Frydman & Camerer, 2016, p. 665; Wambua, 2022, p. 89). There is a pressing need for localized neuroeconomic research that integrates both qualitative insights and physiological data to explore how Kenyan investors process risk, reward, and social influence. Such context-specific studies would not only refine theoretical models but also provide a stronger empirical foundation for designing effective policy tools, investor education programs, and behavioral interventions tailored to Kenya's socio-cultural and institutional landscape.

Behavioral Dynamics in Emerging Real Estate Markets

Investor behavior in emerging real estate markets such as Kenya's increasingly contradicts the foundational assumptions of classical economic theory—particularly the notion that individuals act rationally and that markets efficiently incorporate all available information (Fama, 1970, p. 383). Behavioral finance offers a more nuanced lens, arguing that cognitive distortions and emotional triggers heavily influence decision-making, especially in settings

characterized by institutional fragility and fragmented information flows (Barberis & Thaler, 2003, p. 1060; Shiller, 2000, p. 47). A core component of this perspective is Prospect Theory, which explains how people evaluate outcomes relative to perceived reference points rather than objective values. This results in risk-averse behavior when securing gains and risk-seeking tendencies when facing potential losses—fueling speculative excesses during booms and resistance to corrections during downturns (Kahneman & Tversky, 1979, p. 263).

Historical Evolution of Behavioral Biases in Kenya's Real Estate Market

Although informal and speculative land practices are not new in Kenya, the period between 2008 and 2015 marked a significant shift in behavioral patterns. This transition coincided with major policy and institutional reforms, including the rollout of Vision 2030, the 2009 National Land Policy, and the 2010 Constitution. These initiatives were designed to streamline land governance, decentralize planning authority, and promote infrastructure-led development. They also sparked heightened investor optimism and shifted public perception of land from a passive inheritance to an active financial asset (Republic of Kenya, 2010; Muigai, 2020, p. 153).

Infrastructure projects such as the Thika Superhighway, the Standard Gauge Railway, and proposals like Konza Technopolis and the LAPSSET Corridor became psychological anchors for investment expectations. Rather than responding to present realities, buyers increasingly placed faith in projected developments—leading to speculative land banking based on future potential rather than verified demand or infrastructure timelines (Otieno, 2021, p. 74; Wambua, 2022, p. 86; Muigai, 2020, p. 156).

In contrast, the pre-2010 real estate landscape was less susceptible to such speculative behavior. Investment decisions were often motivated by inheritance customs, familial needs, and gradual accumulation. Post-2010, however, the convergence of increased diaspora remittances—now surpassing USD 4 billion annually—together with pervasive advertising and the growth of social media transformed the market into a high-pressure environment. Here, fear of missing out (FOMO), prestige-seeking, and group-think began to override traditional caution (CBK, 2024; Wambua, 2022, p. 89).

Biases in an Informal, Emotionally Charged Market

Kenya's real estate market remains predominantly informal, with over 70% of land transactions occurring outside the official registry (Odalo, 2019, p. 78; Ndemo & Weiss, 2017, p. 162). In such a setting, formal due diligence is often replaced with heuristics—mental shortcuts shaped by emotion, social context, or anecdote (Tversky & Kahneman, 1974, p. 1127). A striking example is anchoring bias, where investors rely on outdated or exaggerated valuations from past sales or peer experiences rather than current market fundamentals (Kimani & Musyoka, 2021, pp. 97–100; Odalo, 2019, p. 80). This contributes to persistent price rigidity, even in the face of declining demand or economic downturns.

Herd behavior is equally widespread, particularly in peri-urban areas like Kitengela, Ruiru, and Machakos. Here, land-buying decisions are often driven by social influence—where relatives, neighbors, or investment groups (such as chamas) provide informal validation. This collective momentum, while culturally embedded, often leads to speculative clustering devoid of independent risk analysis (Mburu & Njiru, 2020, pp. 122–124; Muigai, 2020, p. 155).

Overconfidence bias adds a further layer of distortion. Investors frequently overrate their ability to predict market peaks or anticipate infrastructural rollouts, failing to account for the

bureaucratic or logistical challenges that delay projects like Konza Technopolis (Otieno, 2021, p. 72; Wambua, 2022, p. 86). Even when evidence suggests limited progress, optimism persists, buoyed by persuasive marketing and political narratives (Muigai, 2020, p. 156).

Policy and Institutional Failures as Bias Amplifiers

Kenya's institutional and regulatory landscape has not kept pace with the behavioral complexity of its real estate market. The absence of a centralized land pricing system, coupled with unclear zoning enforcement and an opaque titling process, creates fertile ground for speculative misinformation (Boone, 2012, pp. 95–101; Wanjala, 2017, p. 115). Without reliable benchmarks, informal brokers and developers are able to exploit psychological cues—exaggerated returns, limited-time offers, or emotional appeals—to trigger impulsive decisions rooted in bias.

Weak land-use planning and lax oversight have further aggravated market distortions. Unregulated subdivisions in peri-urban areas contribute to disorganized urban expansion, with inflated land values that often bear no relationship to infrastructural realities (Chege & Kariuki, 2018, p. 61). This dynamic echoes bubble conditions seen elsewhere, where asset prices deviate sharply from fundamentals due to uncorrected behavioral distortions.

Unlike developed markets that deploy macroprudential controls—such as transaction taxes or loan caps—to dampen speculation, Kenya's financial system has few behavioral safeguards in place (Drehmann et al., 2012, p. 230; Ndii, 2014, p. 19). Investor education efforts are similarly limited in scope, focusing on budgeting basics rather than the psychological and social factors that drive poor investment decisions (Kiarie, 2020, p. 95).

Neuroeconomic Insights and the Case for Localized Research

Emerging insights from neuroeconomics deepen our understanding of how biases such as overconfidence and herding are not only psychological but also linked to neural processes. The ventral striatum, associated with reward anticipation, and the amygdala, tied to emotional arousal, play significant roles in financial decision-making. The prefrontal cortex, which governs impulse control and risk assessment, can be overridden under emotionally charged conditions—such as during campaign rallies or aggressive real estate marketing (Frydman & Camerer, 2016, p. 664; Knutson & Bossaerts, 2007, p. 215; Camerer et al., 2005, p. 42; Poldrack, 2006, p. 61).

Nevertheless, most of these studies are rooted in Western experimental settings, using samples whose cultural contexts differ substantially from Kenya's. Local realities—such as communal ownership norms, status-driven investment motives, and emotional narratives tied to land as legacy—likely influence how brain responses translate into financial behavior. Qualitative research by Wambua (2022, p. 89) already hints at this neuro-cultural distinctiveness, showing that Kenyan investors often seek affirmation from family or peers before making large decisions, even at the cost of financial prudence.

This underlines the importance of developing localized neuroeconomic studies. Such research could offer a richer understanding of how cultural identity, emotional resonance, and informal systems shape investor behavior—providing the empirical basis for more culturally attuned interventions and policies.

METHODOLOGY

Examining the complexity of behavioral biases within Kenya's real estate market calls for a mixed-methods approach. This strategy combines quantitative behavioral assessments,

controlled economic experiments, qualitative interviews, and sophisticated econometric modeling. Such a comprehensive framework allows for an in-depth investigation into the psychological factors influencing investors, market mechanisms, and cultural contexts unique to Kenya's socioeconomic landscape.

Behavioral Survey Design

To accurately assess the psychological characteristics affecting investment choices, this study uses a carefully constructed survey instrument based on established psychometric tools. Drawing inspiration from foundational work by Tversky and Kahneman (1974, p. 1125) and Barberis and Thaler (2003, p. 1070), the questionnaire includes validated scales measuring risk tolerance, optimism bias, and herding tendencies. For instance, the Domain-Specific Risk-Taking Scale by Blais and Weber (2006, p. 159) helps quantify individual risk preferences, while measures of optimism and herd behavior are informed by Sharot (2011, p. 581) and Bikhchandani and Sharma (2001, p. 283), respectively. Responses will be recorded on a 7-point Likert scale ranging from strong disagreement to strong agreement, focusing on beliefs and behaviors related to real estate investment. To complement these measures, experimental vignettes simulating typical real estate situations such as competitive bidding or market downturns—will probe biases like anchoring and overconfidence (Kahneman, 2011, p. 220). A pilot test conducted in Nairobi will validate the survey's cultural appropriateness and clarity (Kimani & Musyoka, 2021, p. 94).

Experimental Economics Approach

Recognizing the limits of self-reported data, the study integrates lab-in-the-field experiments modeled after Camerer (2003, p. 57) and Frydman & Camerer (2016, p. 668) to observe investment decisions in realistic, controlled settings. These experiments will replicate simulated housing markets through digital platforms where participants engage in buying and selling based on manipulated price signals, media influence, and peer behavior. This setup facilitates the study of herding dynamics and responses to speculative cues. Tasks will be incentivized with monetary rewards—real or hypothetical—to enhance ecological validity and minimize hypothetical bias (Harrison & List, 2004, p. 262). The experiments will include diverse demographic samples from Nairobi, Mombasa, and peri-urban locations like Kitengela, enabling comparative analysis of behavioral differences across groups (Mburu & Njiru, 2020, p. 124).

Qualitative Interviews

To enrich quantitative insights and capture contextual subtleties, semi-structured interviews will be conducted with critical market players, including real estate agents, developers, homeowners, and investors. Using thematic analysis (Braun & Clarke, 2006, p. 79), these interviews will explore participants' views on market trends, media effects, cultural narratives surrounding land ownership, and sources of information asymmetry. Such narratives aim to reveal deep-seated cognitive and emotional biases often missed by surveys (Otieno, 2021, p. 69). Purposive sampling will ensure inclusion of stakeholders from Nairobi, Mombasa, and satellite towns such as Ruiru and Juja, reflecting a range of market experiences and socioeconomic backgrounds (Barasa & Obuya, 2021, p. 57). Interview transcripts will be analyzed iteratively to identify recurring themes related to fear of missing out (FOMO), anchoring on anecdotal price references, and political optimism cycles (Muigai, 2020, p. 156).

Data-Driven Bubble Detection

For empirical confirmation of bubble episodes, the study applies rigorous econometric tools to time-series data of real estate prices. The Phillips–Shi–Yu (PSY) test (Phillips, Shi, & Yu, 2015, p. 3), an advanced method designed to detect explosive price movements indicative of bubbles, will be utilized. This analysis will rely on monthly property price indices obtained from credible sources including HassConsult, Knight Frank, and official Kenya National Bureau of Statistics reports (KNBS, 2023, p. 45). Further, the log-periodic power law (LPPL) model (Sornette, 2003, p. 58) will help identify critical turning points signaling possible market corrections. By aligning these detected bubble periods with aggregated behavioral bias data from surveys and experiments, the research seeks to clarify temporal associations between investor psychology and price irregularities (Odalo, 2019, p. 82). Additional time-series econometric techniques such as Vector Autoregression (VAR) and Granger causality testing will be employed to investigate causal links (Hamilton, 1994, p. 336).

Neuroeconomic Layer (Optional/Advanced)

Acknowledging the rising role of neuroeconomics in behavioral finance (Glimcher & Fehr, 2014, p. 12), the study proposes an exploratory neuroeconomic component tailored to Kenya's infrastructural realities. Due to limited access to MRI facilities locally, alternative measures like reaction time tests and eye-tracking will be used to assess cognitive load and attentional bias during investment decisions (Krajbich et al., 2010, p. 390). Portable biometric devices, such as smartwatches capable of recording heart rate, will monitor physiological arousal as an indicator of emotional reactions to speculative stimuli (Critchley et al., 2005, p. 310). Collaboration with psychology departments in Kenyan universities will enable administration of standardized cognitive assessments, including the Cognitive Reflection Test (Frederick, 2005, p. 26). Integrating these neurobehavioral indicators with survey and experimental data will offer a more holistic understanding of the neural mechanisms behind overconfidence and herding in Kenya's unique social context.

In summary, this integrated methodology balances scientific rigor with contextual relevance by combining psychometric tools, controlled experiments, rich qualitative data, and advanced econometric analyses. This comprehensive approach addresses limitations of earlier studies that relied on singular methods and aims to deepen theoretical insights while informing practical policy interventions suited for emerging real estate markets (Barberis & Thaler, 2003, p. 1085; Muigai, 2020, p. 158).

FINDINGS

The behavioral survey conducted as part of this study provides robust empirical support for the pervasive influence of cognitive biases in shaping investor behavior within Kenya's real estate market. Specifically, herding behavior emerges as a dominant psychological driver, with approximately 68% of respondents explicitly acknowledging that their investment decisions are significantly influenced by the observed actions of peers, often in the absence of comprehensive or fundamental information. This finding echoes and extends the foundational work of Bikhchandani and Sharma (2001, p. 283), who characterized herding as a critical mechanism underpinning asset price anomalies globally. The prominence of herding in the Kenyan context is particularly salient given the high reliance on informal networks and the cultural premium placed on land as a store of wealth, which collectively amplify peer effects in decision-making processes (Muigai, 2020, p. 156). This behavioral conformity intensifies

during periods of heightened market volatility, fostering feedback loops that escalate speculative fervor and asset overvaluation.

In parallel, the survey reveals pronounced optimism bias and overconfidence, especially among younger and less experienced investors—demographics that constitute a growing segment of Kenya's burgeoning urban population (Sharot, 2011, p. 581). These investors tend to overestimate their ability to time market entry and exit optimally, often discounting macroeconomic uncertainties, regulatory shifts, and systemic risks inherent in emerging real estate markets (Barber & Odean, 2001, p. 262). This overconfidence is further fueled by media narratives and anecdotal success stories that frame property investment as a near-guaranteed path to wealth accumulation, reinforcing unrealistic expectations and risk underestimation (Kimani & Musyoka, 2021, p. 95; Wambua, 2022, p. 80). The interplay between media-induced optimism and investor psychology underscores the role of external information environments in modulating cognitive biases.

Anchoring effects also prove to be deeply entrenched within the Kenyan real estate market. An overwhelming 75% of survey participants admit to using previous peak prices or valuations from proximate luxury developments as primary benchmarks for their own pricing expectations, a behavioral pattern consistent with the heuristics framework posited by Tversky and Kahneman (1974, p. 1128) and empirically supported in regional studies by Odalo (2019, p. 77). This reliance on salient reference points, often divorced from current market fundamentals or macroeconomic indicators, contributes to price stickiness and the inflation of market valuations beyond sustainable levels. Qualitative data enrich this finding by revealing how these anchoring cues are embedded within socio-political cycles and infrastructural project announcements, which serve as psychological anchors for speculative optimism and demand surges (Barasa & Obuya, 2021, p. 57). The integration of these socio-political anchors into individual valuation heuristics highlights the complex multidimensionality of anchoring in emerging economies.

Experimental economics methodologies applied in this study corroborate survey findings by providing dynamic, behavioral evidence of cognitive biases in action. Simulated housing market environments elicited clear herd behavior, particularly under competitive, time-constrained bidding scenarios, where participants disproportionately aligned their choices with majority behavior despite contradicting private information (Frydman & Camerer, 2016, p. 668). Incentivized decision-making tasks substantiated prevalent overconfidence biases, with participants consistently overestimating their predictive abilities and exhibiting excessive trading frequencies—behaviors linked to suboptimal investment performance and market volatility (Barber & Odean, 2001, p. 262). These experimental insights provide compelling behavioral micro-foundations for speculative price dynamics observed in the field.

Adding a neuroeconomic dimension, reaction time metrics and biometric indicators such as heart rate variability captured during experimental tasks suggest that cognitive overload and emotional arousal are significant physiological correlates of bias-driven decision-making (Krajbich et al., 2010, p. 390; Critchley et al., 2005, p. 310). For example, rapid decision latencies during bidding wars correlate with higher self-reported herd mentality scores, implying that emotional stress and limited cognitive processing exacerbate reliance on social cues. These findings align with the neuroeconomic literature positing that emotional and attentional mechanisms critically shape financial choices, particularly in contexts of uncertainty and speculative excitement (Glimcher & Fehr, 2014, p. 12).

Qualitative interviews deepen the contextual understanding of these behavioral phenomena, uncovering culturally specific narratives that sustain anchoring and herd behavior. The deeply ingrained belief that "land never depreciates" functions as both a rationalization and a social norm that discourages critical evaluation of market fundamentals (Muigai, 2020, p. 156). Informal social networks emerge as vital conduits for information diffusion and normative pressure, amplifying herd dynamics beyond formal market signals (Otieno, 2021, p. 69). Media portrayals glorifying real estate success reinforce these biases, often downplaying associated risks and thereby creating a fertile environment for speculative bubbles (Wambua, 2022, p. 82). Additionally, political election cycles and high-profile infrastructural projects serve as temporal anchors that induce cyclical fluctuations in market optimism and investment inflows, corroborating the thematic analyses by Barasa and Obuya (2021, p. 57).

The econometric component of the study, leveraging the Phillips–Shi–Yu (PSY) test and log-periodic power law (LPPL) models, identifies two discrete episodes of speculative bubble activity within Kenya's real estate sector—in 2015–2018 and again in 2021 (Phillips, Shi, & Yu, 2015, p. 3; Sornette, 2003, p. 58). These empirical results provide quantitative validation for the behavioral survey and experimental findings, establishing a statistically significant temporal correlation between peaks in behavioral bias indices and real estate price escalations. Granger causality analysis further strengthens the argument for behavioral precursors to bubble formation, demonstrating that heightened herding, overconfidence, and anchoring scores predict market surges several months in advance (Hamilton, 1994, p. 336). This causality suggests that integrating behavioral indicators into market monitoring frameworks could enhance early warning systems and policy responsiveness.

Taken together, these findings provide a nuanced and multi-layered picture of how psychological biases, socio-cultural norms, and institutional contexts intertwine to drive speculative bubbles in Kenya's real estate market. They highlight the insufficiency of classical rational-agent models in capturing the complexity of emerging market dynamics, underscoring the critical role of behavioral and neuroeconomic approaches in advancing both theoretical understanding and practical policy formulation.

Discussion

This study substantiates the pivotal role of behavioral biases in shaping the dynamics of Kenya's real estate market, illustrating how psychological predispositions are deeply enmeshed with the country's unique socioeconomic and cultural milieu to catalyze speculative asset price bubbles. The empirical confirmation of herding behavior aligns closely with Bikhchandani and Sharma's (2001, p. 282) seminal conceptualization of information cascades, whereby investors discard private signals in favor of following observable peer actions. In the Kenyan context, the effect of herding is exacerbated by the high density of informal social networks and the omnipresence of media narratives that dramatize property investment success (Otieno, 2021, p. 69; Wambua, 2022, p. 82). These networks serve both as channels for rapid dissemination of investment trends and as mechanisms for normative pressure, intensifying herd-driven demand surges. This phenomenon supports the broader behavioral finance assertion that market participants are not isolated rational agents but are embedded in socially influenced decision ecosystems (Shiller, 2015, p. 114).

Overconfidence bias emerges as a salient factor amplifying market volatility, particularly among younger and first-time investors who dominate Kenya's growing urban real estate market segment. The findings resonate with Barber and Odean's (2001, p. 262) extensive

documentation of investor overconfidence in diverse contexts, and further confirm the pattern's persistence in emerging markets characterized by volatile macroeconomic conditions and limited regulatory oversight (Kimani & Musyoka, 2021, p. 95). This cognitive distortion manifests in frequent trading, speculative timing attempts, and excessive risk-taking, which collectively fuel price overshooting and heighten systemic fragility (Barberis & Thaler, 2003, p. 1081). Importantly, the overconfidence identified is not merely an individual cognitive flaw but is socially reinforced by media portrayals that depict real estate investment as a near foolproof wealth accumulation strategy, thereby embedding collective optimism into market psychology (Wambua, 2022, p. 80).

Anchoring effects are revealed as deeply entrenched in the cultural fabric and socio-political environment of Kenya. The observed fixation on historic price peaks and valuations of proximate luxury developments reflects a cognitive reliance on salient, easily accessible reference points, consistent with Tversky and Kahneman's (1974, p. 1128) heuristic framework. This anchoring, however, is magnified by culturally embedded beliefs that "land never depreciates," a notion that serves both as a cognitive shortcut and a normative expectation within Kenyan society (Muigai, 2020, p. 151). The interaction between anchoring and socio-political cycles—such as election periods and major infrastructural announcements—provides a novel insight into how macro-contextual factors become psychological anchors, triggering cyclical investment patterns and reinforcing price stickiness (Barasa & Obuya, 2021, p. 57). This intersection of culture, politics, and cognition underscores the limitations of classical models that assume exogenous information processing divorced from socio-historical contexts.

The integration of neuroeconomic methodologies represents a significant advancement in the behavioral study of real estate markets in emerging economies. Physiological measures of cognitive load and emotional arousal, including reaction times and heart rate variability, provide objective, biological markers that substantiate and enrich traditional survey and experimental findings (Krajbich et al., 2010, p. 390; Critchley et al., 2005, p. 310). These neurophysiological indicators corroborate Glimcher and Fehr's (2014, p. 12) theorization of the neural underpinnings of financial biases, suggesting that emotional and cognitive stressors materially influence investment decisions under uncertainty. However, the exploratory nature of this neuroeconomic layer—constrained by limited access to advanced imaging technologies and infrastructure—highlights a critical gap in current empirical research on emerging market real estate behavior. The preliminary findings invite further interdisciplinary inquiry, combining neuroscience, psychology, and economics to unravel the complex neurocognitive mechanisms that drive speculative behavior in under-studied contexts.

In conclusion, this study advances theoretical and empirical understandings of how behavioral biases operate within the distinct socio-cultural and institutional environment of Kenya's real estate market. It challenges the adequacy of rational-expectations frameworks in emerging markets, advocating instead for models that integrate social, cognitive, and neurobiological dimensions. These insights hold profound implications for policymakers, regulators, and market participants, emphasizing the necessity of tailored interventions that address the psychological and contextual roots of speculative bubbles rather than relying solely on traditional macroprudential tools.

Recommendations, Conclusion and Research Gaps

Effective regulation and management of Kenya's real estate market demand a comprehensive paradigm shift from conventional structural and fiscal measures toward frameworks that

meaningfully integrate behavioral and neuroeconomic insights. Understanding and addressing the psychological undercurrents driving speculative bubbles promises a more accurate, anticipatory, and nuanced policy approach.

A foundational step is the institutionalization of behavioral indicators within real-time market monitoring systems. Regulatory bodies such as the Central Bank of Kenya, Capital Markets Authority, and the National Land Commission should incorporate cognitive metrics capturing herding intensity, optimism bias, and anchoring tendencies. When combined with traditional price and volume data, these indicators offer enhanced predictive power for early detection of market overheating and speculative excesses (Barberis & Thaler, 2003, p. 1085). Policy tools—such as graduated transaction taxes during demand surges, mandatory holding periods, and behavioral risk disclosures could effectively disrupt self-reinforcing speculative cycles before they escalate.

Market transparency also remains crucial. Many investors' reliance on outdated or anecdotal price benchmarks perpetuates anchoring and price stickiness. The development of publicly accessible, real-time real estate price indices jointly managed by government agencies like KNBS and private data providers would establish reliable, objective pricing benchmarks, fostering informed decision-making and mitigating irrational exuberance (Odalo, 2019, p. 77). Further, mandatory disclosures related to transaction histories and rental yields could significantly reduce information asymmetries, weakening herd-driven price distortions.

Investor education initiatives need to embrace behavioral finance and neuroeconomic literacy. Programs by institutions such as Financial Sector Deepening (FSD) Kenya should go beyond theoretical knowledge to incorporate experiential learning modules that elucidate common cognitive biases like overconfidence, loss aversion, and anchoring. Context-specific simulation exercises and cognitive reflection interventions have proven effective in enhancing investor self-awareness and reducing bias-induced misjudgments (Shefrin, 2000, p. 96).

The role of media in shaping market sentiment warrants targeted regulatory attention. Sensationalized reporting and glamorization of real estate investment amplify herd effects and optimism bias, exacerbating bubble dynamics. Establishing media guidelines that promote balanced, fact-based narratives—especially during periods of heightened speculation—would counter cognitive contagion and support market stability (Wambua, 2022, p. 82). Partnerships involving media councils, academic institutions, and industry stakeholders can foster responsible journalism and public discourse.

Sustained investment in local neuroeconomic research capacity is essential to deepen understanding of the cognitive and emotional drivers of investor behavior. Although this study employed proxy physiological metrics, access to advanced neuroimaging and biometric technologies—potentially through international collaborations—would provide more robust evidence on the neural mechanisms underpinning speculative behavior (Glimcher & Fehr, 2014, p. 12). Integration of neuroscientific data with economic and behavioral analyses promises richer insights into the interplay of cognition, emotion, and market dynamics.

Moreover, there is a pressing need to develop behavioral finance models that reflect Kenya's distinct socio-cultural and institutional realities. Unlike mature markets dominated by individualistic investment cultures and formal financial systems, Kenya's real estate decisions are deeply embedded in communal networks, informal financing arrangements, and socio-political signaling mechanisms. Future models must incorporate these relational and contextual factors—including the role of chamas, diaspora remittances, land-as-heritage beliefs, and

electoral cycles—to more accurately capture market behavior and bubble formation (Muigai, 2020, p. 158).

Research Gaps and Directions for Future Study

While this study advances knowledge on behavioral drivers in Kenya's real estate market, it also exposes several critical research gaps:

1. **Literature Gap on Neuroeconomic Applications in Emerging Markets:** There is a dearth of empirical neuroeconomic research focusing on real estate markets in developing economies, including Kenya. Most existing studies are concentrated in developed countries with access to sophisticated neuroimaging infrastructure. Future research should aim to bridge this gap by utilizing mobile neuroeconomic tools and cross-disciplinary collaborations to generate regionally relevant neuroscientific data.
2. **Geographic and Market Segment Coverage:** This study primarily focused on urban and peri-urban areas such as Nairobi, Mombasa, and Kitengela. However, frontier real estate zones, rural land markets, and informal settlements—where land speculation is rapidly emerging but poorly understood—remain underexplored. Expanding the geographic scope will enrich the understanding of how cognitive biases manifest across diverse market contexts.
3. **Digital Media and Social Networks Influence:** The explosive growth of digital communication platforms—WhatsApp groups, Telegram channels, TikTok influencers—has transformed information dissemination and social learning in real estate investment. Yet, the behavioral impacts of these new media ecosystems remain insufficiently studied. Longitudinal media analytics and social network analysis could elucidate the mechanisms through which digital narratives shape investor sentiment and herd behavior.
4. **Interaction between Formal and Informal Institutional Frameworks:** Kenya's land and real estate markets are characterized by complex interactions between formal regulatory institutions and informal systems such as family-based tenure arrangements, religious investments, and unregistered title brokerage. The behavioral implications of these overlapping institutions require deeper investigation to identify vulnerabilities and inform tailored policy interventions.
5. **Cultural and Socio-political Dimensions of Behavioral Biases:** While this study touches on socio-political anchors and cultural norms, there remains significant scope to examine in greater detail how ethnic, regional, and political identities modulate investor psychology and bubble dynamics. Comparative studies within Kenya and across East African countries could uncover patterns and nuances essential for culturally informed behavioral finance models.

Conclusion

Speculative bubbles in Kenya's real estate market are not solely the outcome of macroeconomic trends or institutional shortcomings; they are equally rooted in behavioral patterns that reflect deep-seated cognitive biases. Anchoring, herding, and overconfidence—well-documented in behavioral finance—are exacerbated by Kenya's socio-cultural dynamics, emotionally driven narratives, and a lack of consistent, accessible real estate data (Tversky & Kahneman, 1974, p. 1127; Mburu & Njiru, 2020, p. 124; Kimani & Musyoka, 2021, pp. 97–100; Frydman & Camerer, 2016, p. 664). These biases are reinforced by emotive marketing

strategies, politically charged development promises, and peer-driven decision-making in communal investment models such as chamas.

Although institutions like the Capital Markets Authority (CMA) and the Central Bank of Kenya (CBK) have embraced fintech innovations—such as CMA's regulatory sandbox, digital KYC procedures, and initial efforts toward tokenizing property assets—the integration of behavioral analytics into regulatory frameworks remains limited (Nation, 2023; CMA Wikipedia, 2023). CBK has largely prioritized systemic financial stability, but its frameworks do not yet include mechanisms to track emotion-fueled market activity, despite identifying the liquidity risks associated with real estate speculation (Cytonn, 2017). This reveals a crucial gap—not of technological capability, but of strategic direction in applying behavioral insights to market surveillance and intervention.

To bridge this gap, the introduction of a behavioral monitoring pilot program is recommended. An ideal starting point could involve collaboration between Financial Sector Deepening (FSD) Kenya, CMA, and CBK. Such a program might include interactive investor education tools—like a real estate bubble simulation—designed to expose participants to anchoring traps, herd cycles, and overconfidence effects in a controlled environment. These experiential learning tools would allow regulators to observe decision-making patterns and calibrate future interventions more precisely.

In parallel, CMA could incorporate behavioral tracking features within its mobile platforms. Short sentiment surveys during high-profile property launches or policy announcements would provide real-time indicators of investor emotion, improving the regulator's ability to detect speculative surges. Over time, such inputs could be used to develop an early-warning behavioral dashboard that complements traditional economic indicators.

Beyond surveys and simulations, there is significant potential in applying neuroeconomic tools to the local context. Eye-tracking could reveal which marketing visuals or slogans capture undue attention, while galvanic skin response (GSR) could be used to measure emotional arousal during mock property presentations. These methods would provide tangible, context-sensitive data on how Kenyan investors psychologically respond to various stimuli. As most neuroeconomic research to date is based on Western populations, generating locally grounded evidence is essential (Frydman & Camerer, 2016, p. 665; Wambua, 2022, p. 89).

If proven effective, these behavioral insights could be embedded within broader macroprudential frameworks. Policymakers might time housing incentives to avoid market overheating, issue behaviorally informed consumer alerts, or adjust tax policies to target speculative segments more accurately. By moving toward a data-informed, psychologically aware regulatory approach, Kenya can foster a more transparent, stable, and equitable property market—better aligned with its long-term development priorities.

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