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Cognitive biases and heuristics in housing investment decision-making: A systematic scoping review and conceptual framework

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Abstract

Housing investment decision-making is particularly susceptible to cognitive biases and heuristics because of asset heterogeneity, limited liquidity, incomplete and asymmetric information, high transaction costs, and substantial uncertainty. This study aims to identify, classify, and explain these biases across different stages of housing investment decision-making and to develop an integrated conceptual framework. A systematic search of studies published from 2000 to 2026 in international and domestic databases was conducted, along with backward and forward citation tracking. The search strategy combined three conceptual domains: housing and real estate, investment decision-making, and cognitive biases and heuristics. In total, 1067 records were identified. After removing duplicates and screening the title, abstract, and full text, 73 journal articles were included in the final synthesis. The findings organize the relevant biases into six major clusters: information-salience biases, reference-point biases, excessive confidence in personal judgment, imitation and social-influence biases, information-selection and interpretation biases, and biases related to loss, fear, and mental accounting. These mechanisms vary across the stages of attention, valuation, market entry, holding, and exit. Accordingly, analyses that neglect how investors receive, interpret, and weight information provide an incomplete account of actual decision-making in housing markets.

Keywords

Behavioral finance
cognitive biases
framework synthesis
heuristics
housing investment
investment decision-making
systematic scoping review

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1. Introduction

Housing is one of the most complex contexts for investment decision-making because it combines a consumption good with a financial asset. In addition to preserving purchasing power, housing provides shelter and a source of economic and social security. Consequently, decisions to invest in housing differ from decisions to purchase ordinary consumer goods and even from decisions to invest in other financial assets. Investors commit substantial capital to assets whose characteristics vary considerably and whose values are affected by legal and regulatory conditions, location, and transaction costs (Wangzhou et al., 2021). In such a market, identifying an appropriate price, selecting the right time to enter or exit, and estimating future risk are difficult. Housing-market information is often incomplete, opaque, and fragmented, while decisions depend partly on local narratives and investors' limited experience (Lowies et al., 2016; Cascão et al., 2023). Accordingly, housing investment decisions cannot be explained solely by the assumption that investors process all available information fully and rationally; cognitive biases and mental heuristics must also be considered (Tversky & Kahneman, 1974; Statman, 1995; Shefrin, 2002).

This study focuses on the intention to invest in housing and clarifies its conceptual meaning and its distinction from homeownership, consumption-oriented purchases, willingness to pay, and reinvestment. Analyzing the role of cognitive biases requires attention to the stages of decision-making. The analytical framework therefore considers four stages: attention and expectation formation, valuation, entry into the market, and holding or exit. This stage-based approach provides a basis for mapping the literature and explaining how particular biases are associated with investors' decision processes.

Although behavioral-finance research has expanded, much of the available literature has concentrated on equity markets and other financial assets. Research specifically addressing housing markets remains fragmented. Cognitive biases in housing investment are often presented as separate factors, without sufficient consideration of housing-market characteristics, the stages of investment decision-making, or how investors search for, process, and interpret information. The central problem, therefore, is to develop an analytical framework that explains cognitive biases and heuristics as a connected set of mechanisms shaped by asset heterogeneity, information asymmetry, social influence, and market uncertainty. Such a framework can organize dispersed behavioral-finance findings and provide a foundation for future empirical research, particularly in less transparent housing markets.

2. Research background

The housing market is one of the markets in which decision-making is particularly complex. This complexity arises from the heterogeneous nature of housing assets, substantial long-term financial commitments, high transaction costs, and incomplete information. Housing is simultaneously a consumer good and an investment asset. On the one hand, it provides shelter and generates utility; on the other, it serves as a capital asset that can preserve and increase wealth over time. These characteristics distinguish investors' behavior in the housing market from their behavior in other asset markets, since each housing unit has unique characteristics in terms of location, construction quality, legal status, rental potential, neighborhood prospects, and resale potential (Perumandla & Bhattacharyya, 2025).

The heterogeneity of housing assets, limited liquidity, the absence of fully transparent pricing and valuation mechanisms, high transaction costs, and certain legal and regulatory complexities make it difficult for investors to value housing assets accurately (Wangzhou et al., 2021). Under such conditions, housing investment intention should be understood as an individual's mental and motivational readiness to allocate resources to residential property, rather than as a concept equivalent to homeownership, a consumption-oriented purchase, willingness to pay, or reinvestment. Homeownership may result from a decision; willingness to pay indicates the amount of resources an individual is prepared to allocate; and reinvestment depends on prior investment experience and the resulting satisfaction or dissatisfaction (Chalil & Zidane, 2026). This distinction is theoretically important because behavioral factors may operate differently at the stages of attention to an opportunity, price evaluation, market entry, asset holding, and market exit.

The efficient market hypothesis and the logic of utility maximization explain investment decisions in terms of access to relevant information, return calculation, risk assessment, and rational choice among alternatives. Under this perspective, asset prices reflect available information, and investors select their investments by

comparing expected benefits with associated costs. However, the housing market may depart from the assumptions of the fully efficient market model because information is not always readily available, assets are heterogeneous, and institutional constraints and market frictions may influence transactions (Fama, 1970; Shawait & Adam, 2011). Behavioral finance research indicates that investors do not rely exclusively on economic calculations when making decisions in complex environments. Instead, they may also draw on emotions, personal experience, rules of thumb, and cognitive biases. The adaptive market hypothesis offers a complementary perspective, viewing investor behavior as an adaptive process shaped by changing market conditions, accumulated experience, environmental pressures, and the availability of information (Lo, 2004). Similarly, the concept of satisficing suggests that, in complex decision-making environments, individuals may not be able to identify the theoretically optimal alternative. Instead, they may settle for an option that is sufficiently satisfactory and feasible. In housing markets, this may lead investors to rely on previous experiences, expert recommendations, and observable market signals rather than conducting a comprehensive analysis of every available alternative (Shishka, 2013; Anli & Patane, 2023).

From a behavioral perspective, housing investment decisions are influenced by more than a few isolated biases. Rather, they emerge from the interaction of multiple cognitive mechanisms and contextual factors. The literature identifies a broad range of biases and heuristics that may affect housing investment decisions, including availability bias, anchoring bias, recency bias, hindsight bias, confirmation bias, categorization bias, the representativeness heuristic, loss aversion, the endowment effect, optimism, the framing effect, mental accounting, status quo bias, ambiguity aversion, the illusion of control, cognitive dissonance, self-attribution bias, self-control, limited breadth of experience, the echo-chamber effect (reinforcement of market narratives), and overconfidence. These mechanisms may overlap, reinforce one another, or operate differently depending on the decision context. Social influences may also shape investment decisions through family members, friends, social networks, reference groups, and cultural norms. Nevertheless, social influence and information-related cognitive biases are conceptually distinct: the former concerns how other people and social environments influence an individual's decisions, whereas the latter concerns how individuals attend to, select, and interpret relevant information (Sam et al., 2025).

Financial literacy may improve individuals' ability to understand interest rates, inflation, borrowing costs, diversification, and real returns, thereby reducing some cognitive errors (Lusardi & Mitchell, 2014; Lusardi, 2015; Sahadeo, 2018; Angrisani et al., 2020). Evidence suggests that greater financial literacy can reduce the representativeness heuristic and anchoring bias and improve investors' performance (Roshangarzadeh et al., 2024). Digital-platform literacy may reduce search, comparison, and information-access costs; however, the volume of advertisements, promotional narratives, rapid circulation of incomplete data, and unreliable asking prices may intensify superficial comparisons, imitative behavior, and informational cascades (Chalil & Zidane, 2026). Nevertheless, empirical evidence on the effect of financial literacy on housing-investor behavior is mixed and suggests a dual effect. On the one hand, financial literacy can strengthen calculation and rational evaluation and mitigate basic errors such as price anchoring. On the other hand, for some investors, a relative increase in financial knowledge may create an illusion of market mastery and false overconfidence, potentially leading to taking risks without adequate assessment and failure to account for fluctuations across the housing-market cycle.

Consequently, the housing market should be understood as a behavioral decision-making environment in which economic fundamentals, personal experience, access to information, financial literacy, and cognitive biases interact. A behavioral analysis of housing investment must therefore consider not only the economic factors that determine the basis of valuation but also the cognitive mechanisms through which investors perceive, interpret, and respond to them. This approach can provide a more comprehensive account of housing investment behavior, as economic conditions shape the information available to investors, while cognitive biases influence how that information is processed and incorporated into decisions.

Table 1. Theoretical dimensions of housing investment decision-making

Main dimension	Conceptual content	Role in housing investment decision-making	Sources
Dual nature of housing	Housing is both a consumer good and an investment asset.	Housing investment decisions involve both property's consumption-related utility and its potential to preserve or increase wealth.	Wangzhou et al. (2021); Perumandla and Bhattacharyya (2025); Chalil and Zidane (2026)
Characteristics specific to the housing market	Asset heterogeneity, limited liquidity, valuation difficulties, and information opacity.	These characteristics complicate asset valuation and make it difficult to assess risk and future returns accurately.	Wangzhou et al. (2021); Perumandla and Bhattacharyya (2025)
Rational economic decision-making	Investment decisions are based on expected benefits, transaction costs, liquidity, holding costs, and risk.	Provides the conventional economic basis for evaluating investment alternatives and explaining housing investment decisions.	Fama (1970); Shawait and Adam (2011)
Bounded rationality	Incomplete information, limited cognitive resources, and possible analytical errors constrain fully rational decision-making.	Limits investors' ability to evaluate all alternatives comprehensively and make fully rational decisions.	Tversky and Kahneman (1974); Perumandla and Bhattacharyya (2025)
Adaptive market hypothesis	Investor behavior adapts to market conditions through experience and behavioral strategies.	Explains how housing investment decisions and behavioral responses may change as market conditions evolve.	Lo (2004); Perumandla and Bhattacharyya (2025)
Satisficing	Under complex conditions, individuals select an alternative that is sufficiently satisfactory rather than necessarily optimal.	Explains reliance on practical rules, experience, and expert recommendations when evaluating housing investments.	Simon (1955); Perumandla and Bhattacharyya (2025)
Cognitive and emotional biases	Heuristics and biases, such as anchoring, availability, hindsight, loss aversion, and overconfidence, influence the interpretation of information.	These mechanisms may alter investors' perceptions of market information and affect investment decisions.	Tversky and Kahneman (1974); Pandey and Jessica (2018); Cascão et al. (2023); Perumandla and Bhattacharyya (2025)
Social and informational influence	Family, friends, social networks, reference groups, and social norms may shape individual behavior.	These influences may reinforce imitation and herd behavior, affecting investment decisions that would otherwise be made independently.	Wangzhou et al. (2021); Sam et al. (2025)
Financial and digital literacy	Financial knowledge and the ability to access, search for, and evaluate information through digital platforms.	Financial literacy may mitigate certain biases, while digital information environments may either improve access to information or reinforce biased responses.	Lusardi and Mitchell (2014); Roshangarzadeh et al. (2024); Chalil and Zidane (2026)
Integrated theoretical framework	Housing investment decisions result from the interaction of economic calculation, experience, information, financial literacy, emotions, and biases. Analysis of the housing market is incomplete without considering behavioral mechanisms.		

3. Research methodology

This study uses a systematic scoping review and framework synthesis to map the scope of the literature, identify key concepts, distinguish behavioral and cognitive mechanisms, and organize the accumulated knowledge into an integrated conceptual framework on the role of cognitive biases and heuristics in housing investment decision-making. A scoping review is appropriate for areas where concepts are scattered, studies are methodologically heterogeneous, and the existing literature requires classification, conceptual delineation, and theoretical reconstruction rather than statistical aggregation (Tricco et al., 2018; Peters et al., 2020).

The review process was designed to ensure a transparent and reproducible approach to defining the research question, identifying information sources, developing the search strategy, applying screening criteria, and reporting the selection process (Tricco et al., 2018; Peters et al., 2020). The PRISMA 2020 was used to enhance the transparency of reporting on the resource identification, screening, and selection stages (Page et al., 2021).

3.1. Research question and scope

The review was structured around the following conceptual question: how do cognitive biases and heuristics influence housing investment decision-making across stages of the investment process, including intention formation, attention and information processing, opportunity assessment, valuation, market entry, asset holding, and exit?

The unit of analysis was defined as journal-based research examining cognitive and behavioral mechanisms in the context of housing investment decision-making. The review did not focus exclusively on individual biases, because some studies examine several behavioral mechanisms simultaneously. Accordingly, the analysis considered the type of bias, market context, study population, stage of investment decision-making, pathways through which biases affect decisions, and potential mediating or moderating factors.

3.2. Time scope and information sources

A systematic search was conducted from the beginning of 2000 through August 23, 2026. The year 2000 was selected as the starting point to focus on contemporary empirical and analytical literature on behavioral biases in housing markets. Studies published before 2000 were not included in the main evidence corpus; however, they were used as foundational theoretical sources when necessary to define concepts and interpret findings. Such sources were not counted as part of the final analytical sample.

The primary search was conducted in specialized databases covering economics, finance, management, and behavioral research, including Scopus, Web of Science Core Collection, EconLit, APA PsycINFO, ABI/INFORM, and Business Source Complete. To increase search coverage and control retrieval of relevant resources, additional searches were performed on the following platforms: ScienceDirect, Emerald Insight, SpringerLink, Wiley Online Library, Taylor & Francis Online, SAGE Journals, and JSTOR.

To identify relevant Persian-language studies, separate searches were conducted in the Scientific Information Database (SID), Noormags, Magiran, and Ensani. The search terms were adapted to the relevant language and database. In addition, the relevant studies'reference lists were examined through backward and forward citation tracking to identify potentially eligible publications that might not have been retrieved by the initial database searches. The same topical and quality criteria applied to English-language sources were also applied to Persian-language studies.

3.3. Search strategy and keywords

The search strategy was developed around three principal conceptual domains. The search terms within each domain were combined using Boolean operators, using synonyms and related expressions to broaden retrieval while maintaining the review's conceptual focus. A record was retained in the initial search set only when its relevance to all three conceptual domains – housing and real estate, investment decision-making, and cognitive biases or heuristics – could be identified in its title, abstract, or keywords.

- Domain 1: Housing and real estate. This domain included terms such as Housing investment, Real estate investment, Property investment, Housing market, Real estate market, and Real property.
- Domain 2: Investment decision-making. This domain included Investment decision, Investment intention, Investment purchase decision, Valuation, Investment entry, Asset holding, Sale or exit, and Reinvestment.
- Domain 3: Cognitive biases and heuristics. In addition to the general terms Cognitive bias, Behavioral bias, and Heuristic, this domain included specific mechanisms such as Availability bias, Recency bias, Representativeness heuristic, Anchoring bias, Overconfidence bias, Herding behavior, Information cascade, Confirmation bias, Loss aversion, Regret aversion, Mental accounting, Status quo bias, Endowment effect, Ambiguity aversion, Illusion of control, Self-attribution bias, Cognitive dissonance, Hindsight bias, Framing effect, and Self-control.

Boolean operators were used to combine the terms. Within each conceptual domain, related terms were joined using OR, while combining the three main domains using AND. The search syntax was adapted to each database's requirements. This approach enabled retrieval of a broad range of potentially relevant studies without restricting the search to publications using only one particular term or label for a behavioral mechanism. The primary search was restricted to titles, abstracts, and keywords to avoid retrieving a large number of studies in which the search terms appeared only incidentally in the full text.

3.4. Eligibility criteria

To enhance the corpus's topical focus, the inclusion criteria were applied at two levels. At the first level, a

study was required to be a peer-reviewed journal article published between 2000 and 2026 in a reputable scholarly journal. Studies in economics, finance, management, business, economic psychology, housing and real estate studies, and related social sciences fell within the scope of the search. At the second level, each article's substantive relevance to the research topic was assessed rigorously. Inclusion in the final corpus required the simultaneous fulfillment of the following criteria:

1. Housing-related context: Housing, real estate, or property had to constitute the principal research context. Studies referring to the housing market only in passing, without sufficient substantive discussion, were not considered eligible.
2. Investment decision-making: The study had to address investment decisions, investment intentions, valuation, opportunity assessment, market entry, asset holding, exit, or reinvestment as a central research issue.
3. Cognitive or behavioral mechanisms: The study had to explicitly examine cognitive biases, behavioral biases, heuristics, or other identifiable cognitive mechanisms relevant to the research question.
4. Theoretical or empirical contribution: The study had to provide theoretical, empirical, or analytical evidence concerning the relationship between behavioral mechanisms and the investment decision-making process.

Studies focusing exclusively on conventional financial-market investments, stock trading, financial derivatives, or other financial assets were excluded from the main evidence corpus when they did not provide a direct, substantive connection to housing investment. Likewise, studies that focused solely on technical real-estate pricing, macroeconomic variables, urban planning, construction, interest rates, or housing economics were excluded when they did not explicitly examine cognitive or behavioral mechanisms in investment decision-making. Studies on housing ownership or purchase were included only when their investment dimension could be distinguished from purely consumption-oriented or owner-occupier decisions.

Research addressing financial literacy, digital literacy, access to information, or risk perception was included in the main corpus only when it directly examined cognitive biases or heuristics in housing investment decisions. Studies addressing these topics without such a direct connection were used, where appropriate, as background sources rather than as part of the main analytical sample.

Studies that did not directly examine one or more cognitive biases or heuristics were excluded from the final review. These included books, book chapters, dissertations, reports, conference papers, and non-journal publications.

3.5. Screening process and final selection of studies

Sources' identification and screening were conducted through a sequence of steps. First, records retrieved from the databases were consolidated, and duplicate records were removed using digital object identifier (DOI) matching and, where a DOI was unavailable, comparisons of publication titles and other bibliographic information. After removing duplicates, restrictions on publication year, document type, language, subject area, and journal-article status were applied. The remaining records were then screened based on their titles, abstracts, and publication details.

- Initial screening: Titles and abstracts were examined to identify studies potentially relevant to housing investment, investment decision-making, and cognitive or behavioral biases. This stage was designed to exclude clearly irrelevant publications and studies that addressed behavioral mechanisms without a meaningful connection to housing investment.
- Full-text screening: The full texts of potentially eligible articles were assessed to determine whether they met the substantive inclusion criteria. Studies were excluded at this stage when their connection to the research question was only incidental or when they did not provide an adequate theoretical or empirical basis for analyzing the relevant behavioral mechanisms.

The initial database searches and backward and forward citation tracking identified 1,067 records. After removing 214 duplicate records, 853 records remained for title-and-abstract screening. At this stage, 654 records were excluded because they did not meet the topical eligibility criteria. The full texts of the remaining 199 articles were assessed. Of these, 126 articles were excluded following the full-text assessment. Ultimately, 73 journal articles were included in the final evidence corpus and used for the framework synthesis.

The foundational sources used to establish the theoretical background were treated separately from the final evidence corpus and were not included in the count of 73 articles.

Table 2. Rationale for source identification, screening, and corpus analysis

Stage	Main criterion	Procedure	Output
Scope definition	Studies published from 2000 to 2026; reputable scholarly journal articles	Applying time and document-type restrictions	Initial search set
Topical search	The simultaneous presence of housing, real estate, investment decision-making, and cognitive biases	Searching titles, abstracts, and keywords	Potentially relevant records
Duplicate removal	Identification using DOIs and bibliographic details, including author, title, and year	Merging records retrieved from databases and removing duplicates	Unique records
Initial screening	Alignment of titles and abstracts with the study's main subject area	Excluding studies lacking direct topical relevance	Studies eligible for full-text assessment
Full-text screening	Direct relevance to housing, investment decision-making, and cognitive biases	Excluding studies with only peripheral relevance to the research topic	Final review corpus
Data extraction	Theoretical, cognitive, and conceptual information	Completing the data-extraction form	Analytical study matrix
Coding and Synthesis	Cognitive and heuristic mechanisms and their roles in decision-making	Conceptual coding and clustering	Thematic clusters and conceptual framework

3.6. Data extraction and framework synthesis

Conceptual data from each study were recorded in a standardized extraction form. The form captured the authors, publication year, journal, geographical context, market type, research design, study population, behavioral constructs, type of bias, stage of investment decision-making, pathway through which the bias or mechanism affected decisions, principal findings, mediating or moderating variables, study limitations, and implications for housing investment decisions.

Framework synthesis was used to organize the dispersed literature into a coherent analytical structure. The extracted evidence was coded using concepts drawn from the behavioral-finance literature and refined through an iterative, stage-by-stage analytical process. The analysis examined the stage of the investment process at which each bias was most relevant. For example, availability and recency biases were associated primarily with attention and opportunity assessment; anchoring and the endowment effect were considered in relation to valuation; overconfidence, optimism, and the illusion of control were associated with risk acceptance and the timing of market entry; herding behavior and informational cascades were linked to the social validation of investment opportunities; and loss aversion, mental accounting, status quo bias, and regret aversion were considered particularly relevant to asset holding, market exit, or decision postponement.

The extracted evidence was analyzed through conceptual coding. Initial codes were consolidated into broader conceptual categories, with the objective of identifying the principal mechanisms represented in the literature. The resulting synthesis identified six major clusters: biases based on information salience, biases based on reference points, biases associated with excessive confidence in personal judgment, biases associated with imitation and social influence, biases related to information selection and interpretation, and biases related to loss, fear, and mental accounts.

3.7. Literature review method

The literature review was based on the premise that reading theoretical texts is an analytical practice aimed at reconstructing each work's internal logic. Accordingly, each text was read as an integrated conceptual whole rather than a collection of isolated statements, with attention to its central problem, assumptions, analytical orientation, and position within the broader network of scholarly discussion. In parallel, note-taking was conducted systematically and iteratively to establish connections among concepts, arguments, and references across sources and to identify points of convergence, divergence, and theoretical gaps (Nateqi Sabet, 2026a).

The analysis proceeded in three sequential steps. First, each text was read in a problem-oriented manner,

focusing on its theoretical perspective and position within the discussion. Second, its themes and arguments were conceptually reformulated in the terminology of the present study to avoid passively reproducing the source text. Third, the notes were analytically connected to reveal conceptual clusters and develop a coherent narrative of the literature (Nateqi Sabet, 2026b).

Accordingly, the literature review in this study is the outcome of a reconstructive and integrative process in which sources were read and connected to develop a coherent analytical account of the relevant literature on cognitive biases and housing investment decision-making.

3.8. Conceptual control and methodological safeguards

Several methodological safeguards were adopted to improve the synthesis's transparency and consistency.

- First, closely related concepts were distinguished according to their underlying mechanisms. For example, herding behavior was distinguished from information cascades. Herding primarily refers to imitating others' behavior, whereas an information cascade occurs when individuals infer information from others' observed choices and may consequently disregard their own information.
- Second, related concepts were grouped at a higher conceptual level while retaining their distinctions. For example, anchoring, the endowment effect, and status quo bias may all involve reference points or existing states, but they were analyzed as distinct mechanisms because their underlying processes and effects on housing investment decisions are not identical.
- Third, studies concerning general financial markets were not included in the final evidence corpus unless they made a substantive contribution to understanding behavioral mechanisms in housing investment. Such studies could be used as theoretical foundations when relevant, but their findings were not treated as direct empirical evidence about housing markets.
- Fourth, duplication across clusters was controlled during the synthesis. A study was included in more than one cluster only when it independently examined multiple distinct behavioral mechanisms. This rule was intended to prevent any single study from receiving artificially greater weight and to minimize unnecessary overlap among clusters.

The methodological quality of the review was therefore assessed in terms of transparency in reporting information sources, the search strategy and eligibility criteria, consistency in the conceptual classification of biases, and the adequacy of the synthesis in preserving the diversity of the available evidence (Tricco et al., 2018; Page et al., 2021).

Overall, the present article combines a systematic scoping review with framework synthesis to organize the literature on cognitive biases and heuristics in housing investment decision-making. The process moves from systematic information retrieval and screening to conceptual coding and stage-based synthesis, transforming a dispersed body of literature into an integrated conceptual framework. Figure 1 illustrates the stages of identification, screening, eligibility assessment, and final inclusion of the 73 selected articles, using the PRISMA 2020 framework.

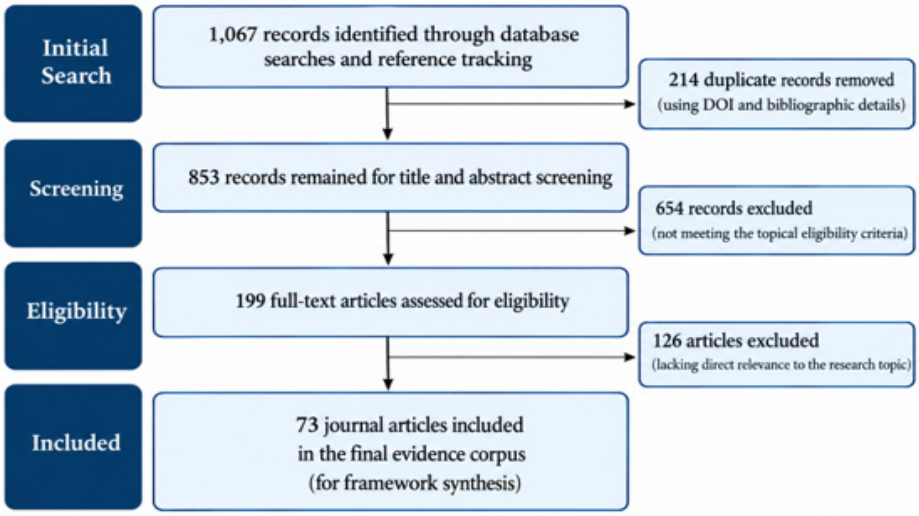


Figure 1. PRISMA 2020 flow diagram of the study selection process

Among the total corpus of studies reaching the final synthesis stage, the empirical-field studies that directly conducted data-driven assessments of housing investors' and buyers' behavior, as distinguished from theoretical, conceptual, and narrative reviews, were isolated, and their comprehensive methodological profiles were documented in Appendix 1.

4. Research findings

Alongside expected returns, housing investment decisions are shaped by a range of cognitive mechanisms and heuristics documented in the literature. These include availability bias, anchoring, overconfidence, herding behavior, information cascades, confirmation bias, loss aversion, mental accounting, and status quo bias (Cascão et al., 2023). The findings indicate that, under conditions of uncertainty, asset heterogeneity, valuation difficulties, and limited access to reliable information, investors rely on their own experiences, reference points, market narratives, and others' perceptions when making decisions (Zheng et al., 2016; Gitau et al., 2019).

The findings are organized into six major clusters: 1) information-salience biases; 2) reference-point biases; 3) biases arising from excessive confidence in personal judgment; 4) imitation and social-influence biases; 5) information-selection and interpretation biases; and 6) biases related to loss, fear, and mental accounts. This classification enables the examination of the relative roles of these clusters across different stages of investment decision-making, from attention and valuation to market entry, asset holding, and exit.

4.1. Information-salience biases

The first cluster of mechanisms affecting housing investment decisions concerns biases arising from the salience and accessibility of information. Availability bias becomes active when investors rely on examples and information that come readily to mind, such as recent price increases in a particular neighborhood, high-profile transactions, or vivid personal experiences of market booms and downturns (Tversky & Kahneman, 1973; Waweru et al., 2014; Salman et al., 2021; Rahmawati & Santi, 2023).

In the behavioral-finance literature, this bias is associated with decision-making based on the ease with which examples can be recalled. It may be particularly consequential in housing markets because of limited transparency, substantial asset heterogeneity, information asymmetry, high transaction costs, and widespread reliance on informal sources of information (Wong et al., 2012; Waweru et al., 2014; Lowies et al., 2016). Studies on real estate investment have identified availability bias, the representativeness heuristic, anchoring, and herding behavior as key mechanisms influencing investors' decisions. Some studies also suggest that, in certain contexts, women and particular groups of individual investors may be more affected by salient and readily available information (Waweru et al., 2014; Pandey & Jessica, 2018; Hoxha & Hasani, 2022; Cascão et al., 2023; Perumandla & Bhattacharyya, 2025).

The range of experiences available to investors may reinforce this bias. Investors may generalize from their own experiences across several properties, market cycles, and time periods, treating those experiences as representative of the housing market as a whole, even when they are not (Waweru et al., 2014; Pandey & Jessica, 2019). This tendency may be more pronounced in emerging markets, where individual investors often have limited access to reliable data and professional analytical tools. Under such circumstances, the availability of vivid examples and personal experiences can increase the likelihood of biased judgments (Simon, 1955; Lo, 2004; Waweru et al., 2014; Salman et al., 2021).

The echo-chamber effect (reinforcement of market narratives) also belongs to this cluster. It occurs when repeated circulation of the same narrative through social networks, family circles, investment groups, or communications from real-estate intermediaries makes that narrative appear more credible and widespread than the available evidence warrants. This mechanism is related to economic narratives, media attention, and informational cascades, because repeated exposure to a news item or personal experience can increase the perceived attractiveness of an investment opportunity beyond what the evidence supports (Bikhchandani et al., 1992; Duan et al., 2009; Shiller, 2022; Wangzhou et al., 2021). Recency bias also causes investors to take recent data more seriously than historical information or long-term trends, and therefore react more quickly and less analytically during periods of price surges or declines (Rose & Armansyah, 2022; Mayora & Lestari, 2024).

The findings further suggest that access to information alone is insufficient to improve investment decisions. The information quality, the ability to analyze historical data, comparative assessment, financial literacy, digital literacy, and the capacity to distinguish reliable evidence from salient but potentially misleading

information all play important roles in mitigating cognitive bias. Table 3 summarizes the mechanisms and related factors identified in this cluster, including availability bias, its amplification in the housing market, limited breadth of experience, data and information-processing constraints, the echo-chamber effect (reinforcement of market narratives), and recency bias.

Table 3. Biases based on information salience and availability in housing investment decision-making

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Availability bias	The tendency to assess the likelihood or importance of an event based on how easily relevant examples come to mind.	Investors readily recall recent price increases, successful transactions, neighborhood-level information, personal investment experiences, and recent market reports.	Investors may overestimate investment opportunities and expected returns while underestimating risk.	Tversky & Kahneman (1973); Waweru et al. (2014); Salman et al. (2021); Rahmawati & Santi (2023)
Amplification of availability bias in the housing market	The ease with which examples can be recalled increases their cognitive salience and influence on investment judgments.	Limited market transparency, uneven access to local data, and constraints on analytical resources may increase reliance on readily available information.	Readily accessible information may receive disproportionate weight in investment decisions, potentially distorting property evaluation.	Wong et al. (2012); Waweru et al. (2014); Lowies et al. (2016); Perumandla & Bhattacharyya (2025)
Limited breadth of experience	Investors may rely on a narrow range of personal experiences when forming judgments about the wider market.	Investors generalize from a limited number of transactions, market observations, or previous investment outcomes.	Limited experience may lead to inaccurate estimates of market conditions and investment outcomes.	Waweru et al. (2014); Pandey & Jessica (2019)
Data limitations and information-processing constraints	Limited access to reliable data and constraints in processing complex information can increase reliance on simplified judgments and readily available cues.	Investors may rely on nearby observations, personal experiences, and easily accessible information when official data or analytical resources are limited.	Incomplete information and constrained processing may impair the quality of investment judgments and increase the likelihood of errors.	Simon (1955); Lo (2004); Waweru et al. (2014); Salman et al. (2021)
Echo-chamber effect (reinforcement of market narratives)	The tendency for repeated exposure to the same market narrative across social networks, family circles, investment groups, or communications from real-estate intermediaries to increase its perceived credibility and influence investment judgments, even when sufficient supporting evidence is lacking.	Repeated claims about price increases, successful investments, or market trends circulate among investors and may appear credible and widespread despite limited supporting data.	Investors may overestimate the attractiveness of housing investment opportunities and rely on repeated market narratives rather than independently verified information.	Bikhchandani et al. (1992); Duan et al. (2009); Shiller (2022); Wangzhou et al. (2021); Perumandla & Bhattacharyya (2025)
Recency bias	Recent information or events receive greater weight than earlier information when judgments are formed.	Investors may place excessive emphasis on recent price movements and market developments when evaluating future housing-market conditions.	Expectations may become overly dependent on recent trends, potentially leading to inaccurate forecasts and investment decisions.	Rose & Armansyah (2022); Mayora & Lestari (2024)
Integrative summary	Information availability and salience interact with investors' experience, access to information, and processing capacity.	Housing-market decisions may be disproportionately influenced by recent, familiar, and easily recalled information, particularly when reliable data and analytical resources are limited.	Improving access to reliable information, comparing multiple sources, and considering a broader range of market evidence may help reduce these biases.	

4.2. Reference-point biases

The second cluster of findings concerns reference-point biases. These biases arise when investors use an initial reference point to evaluate an asset, determine an acceptable price, or make decisions about entering, holding, or exiting an investment. Anchoring is one of the most important mechanisms in this cluster. It occurs when an initial price, a previously observed

value, a past transaction, or a familiar benchmark becomes a dominant reference point and continues to influence subsequent judgments, even when market conditions have changed. Such reference points may include the original purchase price, a seller's asking price, a previous market peak, or a price considered reasonable on the basis of past experience. Asset heterogeneity and the absence of a single, readily observable market price can make housing investors particularly susceptible to these effects (Tversky & Kahneman, 1990; Chapman & Johnson, 1999; Epley & Gilovich, 2001; Lieder et al., 2018; Costa et al., 2017; Zhang et al., 2022).

Evidence from the Kenyan property market suggests that investors often use previous prices and past returns as anchors when evaluating current property values and may fail to incorporate new information adequately. This finding highlights the role of anchoring in property valuation, selling decisions, and investors' resistance to revising their judgments (Murithi, 2014). Evidence from Taiwan indicates that property valuations, particularly under conditions of information uncertainty, may be strongly influenced by price anchors. Investors' judgments may therefore reflect established reference points more than the actual performance of the underlying asset (Chang et al., 2016; Alvin et al., 2019).

Studies of the Portuguese housing market suggest that anchoring, together with herding behavior, the representativeness heuristic, and availability bias, can substantially influence investors' decisions. Investors may remain attached to initial prices or mental reference points and fail to incorporate new information adequately into their judgments (Cascão et al., 2023). Studies of real-estate investment in India and Indonesia further indicate that behavioral biases rarely operate in isolation. Instead, investors' experiences, purchase motives, risk perceptions, and exposure to information may jointly shape their decision-making patterns (Pandey & Jessica, 2018; Pandey & Jessica, 2019; Njo et al., 2019).

The endowment effect is another mechanism related to reference points. It arises when individuals assign a higher subjective value to an asset simply because they own it. Consequently, property owners may value their assets more highly than comparable market evidence would justify, potentially reducing their willingness to sell or revise their asking prices (Litovsky et al., 2022; Zhixiong & Zhongfa, 2022; Zhang, 2023).

Status quo bias also relates to housing investment decisions. Investors may prefer to retain their current position even when a more advantageous alternative is available. In this context, changing an existing investment position or selling a property may be perceived as involving additional psychological costs, uncertainty, and the risk of regret (Samuelson & Zeckhauser, 1988; Harbi & Toumia, 2020). Conservatism is linked to the latter pattern, leading investors to adopt new information slowly or update their prior beliefs insufficiently; consequently, conservatism can both distort individual decision-making and impair collective market functioning (Moradi et al., 2013; Abbasi-Asl et al., 2023).

Overall, the findings indicate that housing markets provide favorable conditions for reference-point biases to influence investment decisions. Price stickiness, the absence of a single observable benchmark, asset heterogeneity, uncertainty, and the significance of prior experience can all strengthen the role of reference points in investors' judgments.

In interpreting these findings, a distinction must be drawn between the two roles of real estate brokers and agents. On the one hand, they can mitigate search costs and information asymmetry by providing details on property characteristics and comparable sales. On the other hand, selectively curating and emphasizing specific comparable prices may turn this very information into a source of price anchoring. Analytically, when commission compensation is contingent upon closing the transaction, a potential conflict arises between the incentive to expedite the deal and providing an impartial valuation. This incentive does not necessarily drive prices upward; rather, it may encourage buyers to raise their offers or nudge sellers to lower their asking prices. Therefore, intermediaries' role cannot be reduced solely to mitigating information asymmetry or inducing price anchors; the direction and magnitude of their impact depend on information transparency, the verifiability of comparable sales, and incentive alignment with the client. Table 4 summarizes the biases identified in this cluster and their implications for housing investment decisions.

Table 4. Reference-point biases in housing investment decision-making

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Anchoring	The tendency to rely on an initial reference point when evaluating prices, even when market conditions change. Initial asking prices, previous transactions, experience, and familiar reference points may influence subsequent judgments.	Investors use initial asking prices, previous property prices, and past market prices as reference points when evaluating properties and negotiating transactions.	Investors may insufficiently adjust their valuations to reflect current market conditions, resulting in biased property valuations and decisions about when to enter, hold, or exit the market.	Tversky & Kahneman (1974); Tversky & Kahneman (1990); Chapman & Johnson (1999); Epley & Gilovich (2001); Costa et al. (2017); Lieder et al. (2018); Zhang et al. (2022)
Anchoring reinforcement	The persistence of an initial reference point despite the availability of new information or changes in market conditions.	Investors continue to rely on familiar prices and previous reference points, even when new information indicates that property values should be adjusted.	Insufficient adjustment to new information may lead to persistent valuation errors and delayed responses to changing market conditions.	Tversky & Kahneman (1974); Costa et al. (2017); Wangzhou et al. (2021); Zhang et al. (2022); Perumandla & Bhattacharyya (2025)
Interaction of behavioral biases	Reference-point biases interact with investors' experience, motivation, risk perception, social influence, and the availability of information.	Investors' past experiences, anchoring, herding behavior, and the availability of information jointly shape property valuation and investment decisions.	The interaction of several behavioral mechanisms may reinforce individual biases and lead to more complex investment-decision errors.	Pandey & Jessica (2018); Pandey & Jessica (2019); Njo et al. (2019); Perumandla & Bhattacharyya (2025)
Endowment effect	The tendency to assign greater value to an asset simply because one owns it.	Property owners may value their properties more highly than comparable market prices would suggest and may be reluctant to sell them.	Owners may demand prices above market value and delay selling, even when alternative investment opportunities are more attractive.	Litovsky et al. (2022); Zhixiong & Zhongfa (2022); Zhang (2023)
Status quo bias	The tendency to maintain the current situation and avoid changing an existing decision, even when a better alternative is available.	Investors may continue holding their current properties rather than selling or reallocating their investments when market conditions or available alternatives change.	Reluctance to change an existing investment position may delay portfolio adjustments and lead investors to miss more attractive opportunities.	Samuelson & Zeckhauser (1988); Harbi & Toumia (2020)
Conservatism bias	The tendency to retain prior beliefs and update them too slowly or insufficiently when new information becomes available.	Investors continue to rely on their prior beliefs about housing prices and market conditions, even when new information becomes available.	Delayed adjustment or distortion of individual investment decisions and potential disruption of collective market functioning.	Moradi et al. (2013); Abbasi-Asl et al. (2023)
Integrative summary	Housing markets contain structural conditions that can reinforce reference-point biases, including price stickiness, the absence of a single universally accepted reference price, property heterogeneity, and information asymmetry.	Investors may rely on initial prices and familiar reference points when evaluating properties, particularly under conditions of uncertainty.	Greater transparency, access to reliable comparative data, and the use of explicit valuation criteria may help reduce excessive reliance on arbitrary reference points.	—

4.3. Biases arising from excessive confidence in personal judgment

The third cluster concerns overconfidence, one of the major biases affecting investment decisions in housing markets. Overconfidence refers to investors' tendency to overestimate their knowledge, analytical ability,

forecasting accuracy, or degree of control over outcomes. In housing investment, it may influence market assessment, property selection, valuation, entry and exit timing, and expectations about future returns (Odean, 1998; Benos, 1998; Bao & Li, 2016; Parveen et al., 2020; Gupta & Shrivastava, 2021).

In the behavioral-finance literature, overconfidence is regarded as an important influence on investment decisions because investors may place excessive weight on their own judgments and underestimate the uncertainty surrounding their forecasts. Rather than adequately accounting for the limits of their knowledge, they may believe that they can interpret market information and anticipate price movements more accurately than they actually can (Bao & Li, 2016; Al Abdin et al., 2017; Parveen et al., 2020).

The findings indicate that overconfidence is associated with gender, income, prior experience, and previous success. For example, some studies show that men may exhibit greater overconfidence than women and higher-income investors may be more overconfident than lower-income investors (Prosad et al., 2015; Rajdev & Raninga, 2016; Isidore & Christie, 2019; Baker et al., 2019). Evidence from housing investment research further suggests that overconfidence, alongside anchoring, herding behavior, the representativeness heuristic, and availability bias, may meaningfully influence property investors' decisions. The strength of these relationships may vary across contexts and investor groups (Pandey & Jessica, 2018; Pandey & Jessica, 2019; Njeru & Matanda, 2023; Cascão et al., 2023; Perumandla & Bhattacharyya, 2025).

Optimism is closely related to overconfidence. It may lead investors to place greater weight on favorable expectations about future market conditions, anticipated demand, or price appreciation than on less favorable evidence. When investors underestimate downside risks or overestimate the likelihood of favorable outcomes, they may make investment decisions that are insufficiently aligned with the underlying market conditions (Suchanek, 2021; Chen et al., 2022; Neal et al., 2022). In housing markets, particularly during boom periods or in areas where price-growth narratives dominate, such optimism may encourage excessive investment, underestimate liquidity risk, and neglect credit-related or institutional costs (Shiller, 2022; Sam et al., 2025).

The illusion of control is another related mechanism. It occurs when investors believe that their experience, knowledge, personal connections, or familiarity with the market gives them greater control over outcomes than is objectively warranted. In housing investment, investors may overestimate their ability to influence or predict developments that are largely determined by broader forces, including inflation, interest rates, regulatory conditions, housing demand, and macroeconomic fluctuations (Langer, 1975; Benassi et al., 1979; Dunn & Wilson, 1990; Klosowski et al., 2021; Schütze et al., 2024).

Self-attribution bias may further strengthen overconfidence. Investors may attribute successful outcomes to their own skill while explaining unsuccessful outcomes in terms of external circumstances. This asymmetry can reinforce their confidence in their own judgment and influence subsequent investment decisions (Miller & Ross, 1975; Daniel et al., 1998; Gervais & Odean, 2001; Koo & Yang, 2018; Abbasi-Asl et al., 2023).

The adaptive-markets perspective helps explain why these behaviors should not be regarded solely as isolated individual errors. Investors make decisions under changing market conditions, limited information, and cognitive constraints; accordingly, both market characteristics and prior experience may influence how strongly these biases emerge (Bao & Li, 2016; Cascão et al., 2023; Sam et al., 2025). In housing markets, the interaction of uncertainty, asset heterogeneity, prior experiences, the reliability of available data, and potentially misleading expectations can reinforce overconfidence and related biases. Table 5 summarizes the biases in this cluster, linking each mechanism to its principal decision-making implications in housing investment.

Table 5. Cognitive biases based on confidence in personal judgment in housing investment decision-making

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Overconfidence	Excessive confidence in one's ability to assess the market, evaluate information, and predict future outcomes.	Excessive confidence in property selection, expected returns, entry and exit timing, and forecasts of future market conditions.	Underestimation of risk and excessive reliance on personal judgment when making investment decisions	Odean (1998); Benos (1998); Bao & Li (2016); Pandey & Jessica (2018); Gupta & Shrivastava (2021)

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Factors reinforcing overconfidence	Personal characteristics and prior experiences may strengthen investors' confidence in their own judgment.	Overconfidence may vary with gender, income, prior experience, and previous investment success. Some studies report greater overconfidence among men and higher-income investors.	Increased reliance on personal judgment and a greater likelihood of overestimating one's investment capabilities	Prosad et al. (2015); Rajdev & Raninga (2016); Isidore & Christie (2019); Baker et al. (2019)
Overconfidence in conjunction with other biases	Overconfidence may operate alongside anchoring, herding behavior, the representativeness heuristic, and availability bias.	Investors may combine confidence in their own judgment with anchoring, imitation of other investors, and selective interpretation of market signals.	Reinforcement of existing biases and changes in investment decisions through the interaction of multiple behavioral mechanisms	Pandey & Jessica (2018, 2019); Njeru & Matanda (2023); Cascão et al. (2023); Perumandla & Bhattacharyya (2025)
Optimism	A tendency to expect favorable outcomes and underestimate the likelihood or consequences of adverse events.	Investors may form overly positive expectations about future prices, rental demand, or regional growth, particularly during market booms or when narratives of price appreciation are prominent.	Excessive investment, underestimating liquidity risk, and neglecting credit-related or institutional costs	Suchanek (2021); Chen et al. (2022); Neal et al. (2022); Shiller (2022); Sam et al. (2025); Perumandla & Bhattacharyya (2025)
Illusion of control	The belief that one's own skills, experience, or actions can influence outcomes that are partly or largely beyond one's control.	Investors may believe their experience, market knowledge, and personal abilities allow them to predict or control housing-market outcomes.	Excessive confidence in personal forecasting and insufficient recognition of uncertainty and external market forces	Langer (1975); Benassi et al. (1979); Dunn & Wilson (1990); Klosowski et al. (2021); Schütze et al. (2024)
Self-attribution bias	The tendency to attribute successful outcomes to one's own ability while attributing failures to external circumstances.	Investors may interpret successful investments as evidence of personal skill and explain unsuccessful outcomes by referring to external market factors.	Reinforcement of overconfidence and reduced learning from investment mistakes	Miller & Ross (1975); Daniel et al. (1998); Gervais & Odean (2001); Koo & Yang (2018); Abbasi-Asl et al. (2023)
Integrative summary	These biases interact with investors' prior experiences, market information, and assessments of their own abilities.	Housing investors may rely excessively on personal judgment, past successes, and optimistic expectations when evaluating properties and market conditions.	Investment decisions may insufficiently reflect uncertainty, information limits, and the possibility of adverse outcomes.	—

4.4. Imitation and social-influence biases

The fourth cluster concerns herding behavior, social influence, and informational cascades. In housing markets, investment decisions are not made solely based on individual analysis. Family members, friends, colleagues, social networks, market intermediaries, and other investors' experiences may all influence how individuals perceive investment opportunities. Studies of housing investment indicate that family recommendations, peer experiences, social expectations, and information exchanged within networks can affect investors' decisions (Biamukda & Tan, 2016; Susanto & Njo, 2019; John et al., 2020).

Herding occurs when individuals follow others' behavior instead of relying primarily on their own independent analysis. For example, investors may interpret increasing demand in a particular neighborhood, rising transaction volumes, or the popularity of a certain property type as evidence that an investment opportunity is attractive (Berger et al., 2018; Susanto & Njo, 2019; Yang et al., 2020). Informational cascades can arise when others' observed decisions are interpreted as evidence that those individuals possess superior information. Investors may consequently disregard their own uncertain or conflicting assessments and follow the decisions of other market participants. Thus, an informational cascade involves not merely imitation but also a process through which others' behavior becomes a source of information in its own right (Ottaviani & Sørensen, 2000; Çelen & Kariv, 2004; Duan et al., 2009; Wangzhou et al., 2021).

Evidence from housing investment research suggests that herding may interact with other behavioral mechanisms, including anchoring, availability bias, and overconfidence. Rather than operating independently, these biases may jointly shape how investors interpret market signals and assess an investment's attractiveness (Pandey & Jessica, 2018; Pandey & Jessica, 2019; Cascão et al., 2023).

At the conceptual level, social influence and informational cascades should be distinguished. Social influence encompasses pressure, expectations, recommendations, and group norms that shape an individual's behavior. Informational cascades, by contrast, arise when individuals infer information from others' actions and let those actions influence their decisions. Nevertheless, the two mechanisms may reinforce each other. Family recommendations, successful experiences reported by peers, and repeated claims about a neighborhood's investment potential can simultaneously exert social pressure and create the impression that a particular investment is supported by reliable information (Biamukda & Tan, 2016; Susanto & Njo, 2019; Wangzhou et al., 2021; Sam et al., 2025).

These mechanisms may be especially consequential in markets characterized by limited information transparency, high analytical costs, heterogeneous assets, and restricted access to reliable official data. Under such conditions, reliance on social signals may contribute to rushed purchases, price bubbles, and intensified upward or downward market waves (Wong et al., 2012; Lowies et al., 2016; Wangzhou et al., 2021; Shiller, 2022). Digital platforms and social networks can broaden access to data and facilitate comparisons. However, the rapid circulation of advertisements, promotional narratives, misleading signals, and repeated circulation of the same narrative may also reinforce informational cascades and imitative behavior (Duan et al., 2009; Chalil & Zidane, 2026).

The findings suggest that housing investment decisions, particularly during market booms, may be shaped by observing others' behavior, fear of missing out on an investment opportunity, trust in close social networks, cultural narratives about the enduring value of property, and the interpretation of collective behavior as evidence that an investment opportunity is credible. Accordingly, herding and informational cascades constitute a distinct cluster of mechanisms that influence housing investment decisions. Table 6 summarizes the relevant mechanisms and their implications.

Table 6. Imitation, social influence, and informational cascades in housing investment decision-making

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Influence of close social networks	Investors' decisions are influenced by family recommendations, friends' experiences, and the behavior of people in their immediate social networks.	Family members, friends, and acquaintances may influence investment choices through recommendations, shared experiences, and information about housing opportunities.	Investors may rely on others' experiences and opinions rather than independently assessing investment opportunities.	Biamukda & Tan (2016); Susanto & Njo (2019); John et al. (2020); Sam et al. (2025)
Distinguishing social influence from general market trends	Social influence operates through interpersonal recommendations and pressure, whereas general market trends reflect broader market developments and aggregate behavior.	Investors may interpret recommendations from close contacts and widely shared market opinions as evidence of a particular investment's attractiveness.	Failure to distinguish interpersonal influence from general market trends may increase reliance on others' judgments and reduce independent evaluation.	Biamukda & Tan (2016); Susanto & Njo (2019); John et al. (2020); Sam et al. (2025)
Herding behavior	Investors follow others' behavior rather than making decisions based on solely their own independent analysis.	Investors may interpret increased demand in a neighborhood, rising prices, or widespread buying activity as signals of an attractive investment opportunity.	Independent decision-making may weaken, while imitation and collective behavior may intensify.	Banerjee (1992); Bikhchandani et al. (1992); Berger et al. (2018); Susanto & Njo (2019); Yang et al. (2020)
Informational cascades	Investors infer information from the decisions of others and may follow those decisions even when their own information or private signals suggest otherwise.	Investors may disregard their own information and follow other investors' behavior, treating others' decisions as evidence of superior knowledge.	Investment decisions may become dependent on observed behavior rather than independent evidence and analysis.	Bikhchandani et al. (1992); Ottaviani & Sørensen (2000); Çelen & Kariv (2004); Duan et al. (2009); Wangzhou et al. (2021)

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Combination of social imitation with other biases	Social imitation may interact with other cognitive biases, including availability bias, anchoring, and the representativeness heuristic, reinforcing their influence on investment decisions.	In housing markets, herding behavior may interact with information availability and anchoring, strengthening the influence of market narratives and reference prices.	The combined influence of multiple biases may reinforce decision-making errors and make independent evaluation more difficult.	Pandey & Jessica (2018); Pandey & Jessica (2019); Cascão et al. (2023); Perumandla & Bhattacharyya (2025)
Distinguishing social influence from informational bias	Social influence is associated with interpersonal or group pressure, recommendations, and observed behavior, whereas informational bias concerns how individuals receive, interpret, and process information.	Recommendations, group pressure, and observed market behavior can influence investment decisions, while the interpretation of information determines how investors understand and respond to those signals.	Distinguishing these mechanisms helps clarify whether investment decisions are driven primarily by social pressure or by information interpretation.	Bikhchandani et al. (1992); Çelen & Kariv (2004); Sam et al. (2025)
Integrative summary	Housing investment decisions, particularly during market booms, may be shaped by observing others' behavior, fear of missing out on an investment opportunity, trust in close social networks, and cultural narratives about the enduring value of property.	Investors may interpret collective behavior as evidence that an investment opportunity is credible and that property retains long-term value.	Investment decisions may be shaped by the combined influence of social pressure, informational cascades, and shared market narratives.	

4.5. Information-selection and interpretation biases

The fifth cluster concerns biases in the selection, interpretation, and evaluation of information. Confirmation bias occurs when investors selectively seek, favor, or interpret evidence that supports their existing beliefs, expectations, or initial judgments, while discounting or disregarding contradictory information (Molz & Giessen, 2001; Costa et al., 2017; Rose & Armansyah, 2022). Although confirmation bias has received less attention than some other biases, the literature indicates it is an increasingly important area of inquiry and may affect individual investors' decisions, financial-market efficiency, and decision-making stability (Costa et al., 2017).

Findings reported by Rose and Armansyah (2022) suggest that confirmation bias may allow investors to make decisions more quickly and easily based on existing beliefs, but this apparent efficiency can lead to harmful choices. For example, investors may hold a loss-making asset for too long or overlook a profitable investment opportunity because it conflicts with their prior beliefs. In housing investment, this bias may lead individuals who have become interested in a property or neighborhood to give greater weight to information that confirms anticipated price growth, the appropriateness of the price, investment security, or the correctness of their initial choice, while disregarding contradictory evidence. This tendency may be particularly pronounced in markets with heterogeneous assets, opaque prices, and reliance on intermediaries, local experience, advertisements, and social narratives (Wong et al., 2012; Pandey & Jessica, 2018; Cascão et al., 2023).

Information-selection biases can be particularly consequential in markets where properties differ substantially in their physical characteristics, location, legal status, and potential uses. Investors may selectively attend to the features that support their preferred valuation or investment decision rather than integrating the full range of relevant evidence. The resulting assessment may therefore reflect selective attention and interpretation more than a balanced evaluation of the available information (Wong et al., 2012; Pandey & Jessica, 2018; Cascão et al., 2023; Perumandla & Bhattacharyya, 2025).

Cognitive dissonance operates similarly within this cluster. When investors encounter information that conflicts with an initial decision, they may experience psychological discomfort and attempt to reduce it by ignoring or downplaying contradictory data, attributing failure to external factors, or continuing to defend a loss-making decision (Festinger, 1957; Goetzmann & Peles, 1997; Olsen, 2008; Fatima, 2019). In real-estate decisions, this response may be particularly strong because housing purchases and investments are typically large, costly, relatively illiquid, and sometimes

closely tied to personal identity. Consequently, acknowledging an error in the choice of property, location, purchase price, or timing of entry may be especially difficult for investors.

Categorization bias may also affect how investors process complex information. Investors may place properties, neighborhoods, developers, or other investors into simplified mental categories such as "growth area," "safe property," "luxury neighborhood," "market in recession," or "market in boom," and then make overall judgments based on those labels. Although categorization can simplify complex information, it may conceal within-category differences, contradictory evidence, and property-specific characteristics (Mullainathan, 2002; Gabaix, 2010; Hong et al., 2007).

Hindsight bias may further affect the interpretation of market outcomes. After an event occurs, investors may perceive the outcome as more predictable than it actually was beforehand. This retrospective reconstruction can strengthen confidence in their forecasting ability and distort their evaluation of earlier decisions (Fischhoff & Beyth, 1975; Bukszar & Connolly, 1988; Biais & Weber, 2009; Goodwin, 2010; Merkle, 2017).

The literature also suggests that confirmation bias may be reinforced by mental accounting: individuals may assign greater weight to information consistent with their mental accounts than to relevant but contradictory information, interpreting financial resources, gains, losses, and assets in separate mental categories rather than through an integrated assessment (Shefrin & Thaler, 1988; Molz & Giessen, 2001; Antonides et al., 2011; Shantha Gowri & Ram, 2019). The central implication is that improving access to market information does not, by itself, eliminate bias. How information is selected, compared, interpreted, and integrated into a decision is also important. Table 7 summarizes these mechanisms.

Table 7. Biases based on information selection, confirmation, and interpretation in housing investment decision-making

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Confirmation bias	The tendency to seek, select, and interpret information in ways that support existing beliefs and expectations, while giving insufficient consideration to contradictory evidence.	Investors may selectively attend to information that supports their prior assessment of a property or their expectations about the housing market, while overlooking evidence that challenges their initial judgment.	Selective consideration of evidence may reinforce existing beliefs, distort the evaluation of investment opportunities, and lead investors to overlook potentially profitable alternatives.	Molz & Giessen (2001); Costa et al. (2017); Rose & Armansyah (2022)
Reinforcement of confirmation bias in the housing market	Confirmation bias may strengthen when investors evaluate properties using familiar assumptions, personal experience, and information consistent with their existing expectations.	Investors may give greater weight to familiar narratives, prior beliefs, and information that supports their preferred property valuations, particularly in markets with heterogeneous assets and information asymmetry.	The reinforcement of existing beliefs may weaken objective evaluation, increase the likelihood of biased investment decisions, and reduce consideration of alternative opportunities.	Wong et al. (2012); Pandey & Jessica (2018); Cascão et al. (2023); Perumandla & Bhattacharyya (2025)
Cognitive dissonance	The psychological discomfort arising when new information conflicts with existing beliefs, decisions, or expectations. Individuals may attempt to reduce this discomfort by reinterpreting information or attributing unfavorable outcomes to external factors.	Investors may rationalize unsuccessful investments, attribute losses to external market conditions, or reinterpret contradictory information to maintain confidence in an earlier investment decision.	Cognitive dissonance may make it difficult to accept mistakes, revise investment judgments, and respond appropriately to changing market conditions.	Festinger (1957); Goetzmann & Peles (1997); Olsen (2008); Fatima (2019)
Categorization bias	The tendency to simplify complex information by organizing it into familiar mental categories, potentially overlooking differences within categories or similarities across them.	Investors may classify properties, neighborhoods, or market conditions using familiar categories and labels, such as growth areas, luxury properties, or declining markets, rather than evaluating each investment comprehensively.	Simplified categorization may distort comparisons, obscure relevant differences between investment opportunities, and affect property valuation and investment decisions.	Mullainathan (2002); Gabaix (2010); Hong et al. (2007)

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Hindsight bias	The tendency to see past events as more predictable after their outcomes are known, leading individuals to overestimate their ability to anticipate those outcomes.	After housing prices rise or fall, investors may believe the market direction was obvious from the beginning, and the outcome could have been predicted.	Hindsight bias may reinforce excessive confidence in forecasting abilities and weaken learning from previous investment decisions, thereby affecting subsequent judgments.	Fischhoff & Beyth (1975); Bukszar & Connolly (1988); Biais & Weber (2009); Goodwin (2010); Merkle (2017)
Mental accounting	The tendency to evaluate and categorize financial resources in separate mental accounts rather than considering wealth and investment outcomes as a unified whole.	Investors may evaluate housing investments differently depending on the perceived source or purpose of funds, prior gains and losses, or the mental category assigned to a particular investment.	Separate mental accounts may lead to inconsistent evaluations of financial information, reinforce subjective judgments, and prevent the integrated assessment of investment choices and outcomes.	Shefrin & Thaler (1988); Molz & Giessen (2001); Antonides et al. (2011); Shantha Gowri & Ram (2019)
Integrative summary	The central issue in housing investment is not merely the amount of available information, but also how investors select, confirm, interpret, and evaluate it in relation to their existing beliefs and mental categories.	Investors may selectively process market information, rely on familiar interpretations, rationalize prior decisions, and use simplified mental categories when evaluating housing opportunities.	Increasing the volume of market information alone may be insufficient. More balanced evaluation requires comparing data, considering contradictory evidence, and critically reassessing existing assumptions.	—

4.6. Biases related to loss, fear, and mental accounts

The sixth cluster concerns loss aversion, ambiguity aversion, mental accounting, self-control, and status quo bias. These mechanisms shape housing investors' behavior because investment decisions involve not only expected financial returns but also psychological responses to potential losses, uncertainty, and the prospect of regret.

Loss aversion refers to the tendency for losses to have a greater psychological impact than equivalent gains. Investors may therefore retain an underperforming asset for too long to avoid realizing a loss, delay exiting the market during a downturn, or postpone a decision to sell a property whose value has declined (Hwang & Satchell, 2010; Mbaluka et al., 2012; Kahneman & Tversky, 2013). In housing markets, high asset values, limited liquidity, high relocation costs, and emotional or identity-based attachment to the property may intensify these tendencies. Investors may focus on recovering their initial investment or returning to a previous price level rather than reassessing the decision in light of current market conditions (Samuelson & Zeckhauser, 1988; Litovsky et al., 2022).

Ambiguity aversion may also affect housing investment decisions. It arises when individuals prefer situations with more clearly understood probabilities and outcomes over situations involving uncertainty or insufficient information. Investors may consequently avoid potentially attractive opportunities when they lack confidence in the validity of ownership documents, the prospects of a neighborhood, regulatory stability, resale possibilities, loan conditions, or the future path of housing prices (Ellsberg, 1961; Easley & O'Hara, 2009; Antoniou et al., 2015; Dimmock et al., 2016; Abbasi-Asl et al., 2023).

Mental accounting is another important mechanism. Investors may mentally separate financial resources according to their perceived sources or purposes – for example, savings, loans, proceeds from selling foreign currency or a car, inheritance, or rental income. These mental categories can influence property-purchase decisions, risk tolerance, the timing of market entry, financing choices, and even willingness to tolerate losses, as well as decisions about holding, selling, or reinvesting in property (Shefrin & Thaler, 1988; Molz & Giessen, 2001; Antonides et al., 2011; Zhixiong & Zhongfa, 2022).

Self-control relates to investors' ability to adhere to a financial plan, maintain a budget, delay decisions when appropriate, tolerate planned fluctuations, and avoid emotionally driven trading. In investment contexts, self-control may be reflected in the ability to adhere to an asset-allocation plan and avoid emotionally driven responses to short-term market fluctuations. Insufficient self-control may undermine financial discipline and increase the likelihood of

decisions driven by immediate emotional reactions (Gamst-Klaussen et al., 2019; Sekścińska et al., 2021; Anwar et al., 2023).

Status quo bias can reinforce these mechanisms by making investors reluctant to change an existing position. Even when a better alternative becomes available, the perceived psychological costs of change, fear of regret, and attachment to the current asset may discourage action (Samuelson & Zeckhauser, 1988; Ritov & Baron, 1992; Schweitzer, 1994; Freiburg & Grichnik, 2013; Harbi & Toumia, 2020). Regret aversion is also linked to these mechanisms. To avoid anticipated regret, investors may postpone decisions to enter or exit the market, regard collective decisions as safer, or refrain from acting independently under volatile market conditions (Mayora & Lestari, 2024).

Overall, the findings indicate that cognitive biases influence housing investment decisions not only at the point of market entry but also during information processing, valuation, asset holding, and exit. Consequently, analytical frameworks that focus exclusively on expected returns, prices, interest rates, or income overlook part of the actual decision-making process. Investors' expectations, perceptions, responses to uncertainty, mental representations of financial resources, and capacity for self-control also shape their behavior in housing markets. The six clusters identified in this study therefore provide a behavioral perspective for understanding housing investment decisions across their different stages. Table 8 outlines the biases associated with this cluster and their mechanisms of impact on the housing market.

Table 8. Biases related to loss, fear, and mental accounting in housing investment decision-making

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Loss aversion	The tendency to experience losses more strongly than equivalent gains. Investors may hold on to losing assets to avoid realizing a loss and may be reluctant to sell below their purchase price.	Investors may delay selling properties, retain assets during market downturns, and focus on recovering their initial investment rather than reassessing current market conditions.	Loss aversion may delay market exit, prevent capital's reallocation, and lead investors to retain assets despite unfavorable market conditions.	Hwang & Satchell (2010); Mbaluka et al. (2012); Kahneman & Tversky (2013)
Amplification of loss aversion in the housing market	High asset values, limited liquidity, substantial transaction costs, and the difficulty of reversing investment decisions may intensify loss aversion.	Investors may be reluctant to sell properties because of their high value, limited liquidity, substantial transaction costs, and uncertainty about alternative investment opportunities.	Loss aversion may be reinforced, making investors less willing to reassess their positions or sell assets when market conditions deteriorate.	Samuelson & Zeckhauser (1988); Litovsky et al. (2022); Perumandla & Bhattacharyya (2025)
Ambiguity aversion	The tendency to avoid choices when the probabilities of possible outcomes or the reliability of available information are unclear.	Investors may hesitate to pursue housing opportunities when reliable information about market conditions, future prices, regulatory requirements, or expected returns is unavailable or insufficient.	Ambiguity aversion may lead investors to avoid potentially profitable opportunities, even when the expected outcomes may be favorable.	Ellsberg (1961); Easley & O'Hara (2009); Antoniou et al. (2015); Dimmock et al. (2016); Abbasi-Asl et al. (2023)
Self-control	The capacity to regulate impulses, maintain financial discipline, and adhere to long-term plans rather than respond to immediate emotional or psychological pressures.	Investors' budgeting, financial resource allocation, and investment decisions may be affected by their ability to control impulses and maintain long-term financial plans.	Stronger self-control may help investors maintain financial discipline, follow investment plans, and avoid decisions driven by short-term emotional reactions.	Shefrin & Thaler (1988); Gamst-Klaussen et al. (2019); Sekścińska et al. (2021); Anwar et al. (2023)
Status quo bias	The tendency to remain in the current situation or resist changing an existing decision, even when a better alternative is available. This tendency may be reinforced by fear of regret, perceived costs of change, the endowment effect, loss aversion, and a preference for inaction.	Investors may hold existing properties and maintain their current investment positions despite changing market conditions or the availability of more attractive alternatives.	Status quo bias may delay necessary adjustments, reinforce attachment to existing investments, and prevent investors from responding effectively to changing conditions.	Samuelson & Zeckhauser (1988); Ritov & Baron (1992); Schweitzer (1994); Freiburg & Grichnik (2013); Harbi & Toumia (2020)

Bias or mechanism	Definition and underlying mechanism	Manifestation in the housing market	Decision implications	Sources
Regret aversion	The tendency to avoid independent action or changing an existing decision to avoid anticipated regret.	Investors may postpone decisions to enter or exit the market, regard collective decisions as safer, or avoid acting independently in volatile market conditions.	Delayed decision-making and greater reliance on collective behavior.	Mayora & Lestari (2024)
Integrative summary	Housing investment decisions are shaped not only by expected returns and market prices, but also by loss aversion, ambiguity, emotional responses, mental accounting, and self-control.	Investors' responses to market information, property valuation, risk, uncertainty, and prior experiences may influence their decisions to enter, hold, sell, or reallocate investments.	A comprehensive understanding of housing investment requires considering behavioral mechanisms alongside economic factors, including uncertainty, perceived risk, psychological attachment, and the capacity for self-regulation.	—

Although constructs such as the endowment effect and status quo bias are discussed in both Cluster 2 (reference-point biases) and Cluster 6 (biases related to loss and fear), this overlap reflects their distinct functions at different stages of investment decision-making. In Cluster 2, these biases are examined primarily as cognitive reference points in property valuation and initial pricing, whereby investors use the purchase price or the value of their current asset as a benchmark for subsequent judgments. In Cluster 6, by contrast, these constructs are considered emotional and motivational drivers of asset holding and resistance to selling loss-making properties, rooted in the strong aversion to realizing losses and the desire to avoid anticipated regret.

5. Conclusion

The housing market, characterized by asset heterogeneity, limited liquidity, information asymmetry, incomplete price information, high search costs, and complex legal and credit-related considerations, provides favorable conditions for the activation of cognitive biases and heuristics. Housing investment intention should be distinguished from homeownership, the decision to purchase a property, willingness to pay, and reinvestment, as each concept relates to a different stage of the decision-making process. This review indicates that cognitive biases do not operate uniformly across all stages of housing investment. Availability and recency biases are particularly relevant to attention, opportunity identification, and expectation formation; anchoring and the endowment effect influence valuation and selling decisions; overconfidence and optimism affect risk acceptance and market entry timing; and loss aversion and status quo bias play important roles in asset holding and market exit. Accordingly, housing investment behavior should be understood as a dynamic process rather than as a fixed list of independent biases. Each mechanism must be examined in relation to its role in attention, information search, valuation, decision-making, holding, and exit.

These findings suggest that cognitive biases are integral to investment decision-making in a market where information is fragmented, costly to obtain, unequally distributed, and sometimes unreliable. This conclusion is consistent with behavioral finance and the adaptive markets hypothesis, both of which recognize that investors operate in complex environments and move between analytical reasoning, personal experience, intuition, market narratives, and emotional responses. Understanding housing investment decisions therefore requires more than examining cognitive biases in isolation. Economic factors such as expected returns, location, rental income, capital appreciation, credit conditions, and legal security form the basis of investment evaluation, while cognitive biases influence how these factors are perceived, interpreted, and weighted. Availability bias, anchoring, overconfidence, confirmation bias, loss aversion, mental accounting, herding behavior, and status quo bias may jointly influence market entry, investment timing, pricing, asset holding, selling, and the interpretation of past experiences.

Practically, improving housing investment decisions requires more than increasing the volume of available information or expanding digital real-estate platforms. It also requires greater transparency in actual transaction prices, appropriate financial education, improved digital-platform literacy, regulation of advertising data, tools for comparing investment risks and returns, and reliable advisory mechanisms. These

measures may help investors evaluate opportunities more critically, distinguish verified evidence from persuasive market narratives, and make better-informed decisions under uncertainty.

The intensity and form of cognitive biases may also vary according to the structural characteristics of housing markets. In developed markets, where transparent databases, verification institutions, and diverse financial-analysis tools are more accessible, biases may remain prominent in analytical processes, particularly through confirmation bias and overconfidence. In emerging markets, by contrast, pronounced information asymmetry, the absence of comprehensive transaction databases, and macroeconomic instability may strengthen the influence of social networks, informal information sources, real-estate intermediaries, herding behavior, and loss aversion. In economies with high inflation and uncertainty, these mechanisms may cause individual decisions to develop into collective waves and broader market consequences. Analyzing cognitive biases is therefore important both for advancing behavioral explanations of real-estate investment and for designing policies that improve transparency, financial education, and investor protection.

Several conceptual and empirical limitations remain in this field. Existing studies do not always distinguish clearly among herding behavior, informational cascades, peer influence, and the echo-chamber effect (reinforcement of market narratives), even though these mechanisms differ in their social, informational, and cognitive foundations. In addition, the predominance of cross-sectional and self-reported studies limits our understanding of how biases evolve across housing-market cycles, including periods of growth, downturn, and uncertainty. Future research should employ longitudinal research designs and actual transaction data to examine changes in cognitive biases across different stages of investment decision-making and market cycles. It should also investigate locally adapted measurement scales and test the roles of digital platforms, information asymmetry, and social and institutional contexts in the formation and development of these biases.

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Appendix 1. Methodological characteristics of all synthesized empirical field studies

No.	Author and year	Country/ geographical context	Research design and data collection instrument	Sample size and population	Core biases/ behavioral constructs	Key findings regarding housing decision-making
1	Waweru et al. (2014)	Kenya	Quantitative survey using a questionnaire; multiple regression	142 individual real estate investors	Availability, representativeness, overconfidence, anchoring, herding behavior	Easy access to news about recent successful transactions has the greatest influence on market entry. Overconfidence is more pronounced among men and experienced investors.
2	Lowies et al. (2016)	South Africa	Quantitative, descriptive study and correlation analysis	36 senior managers and analysts of real estate funds	Heuristics, anchoring, availability, conservatism	Even professional institutional real estate analysts rely heavily on initial asking prices (anchors) under conditions of severe information asymmetry.
3	Chang et al. (2016)	Taiwan	Quantitative analysis of actual transaction data using a hedonic model	Official database of registered housing transactions	Buy-side anchoring, reference points	Buyers use the previous purchase price or the first quoted price as an anchor and make insufficient price adjustments during negotiations.
4	Pandey & Jessica (2018)	India	Quantitative study using item response theory (IRT) and a survey	435 residential and commercial real estate investors	Loss aversion, mental accounting, endowment effect, overconfidence	Loss aversion and the endowment effect have the greatest discriminatory power in explaining the tendency to avoid selling properties during market downturns.
5	Pandey & Jessica (2019)	India	Structural equation modeling	350 individual housing investors	Behavioral biases, investment satisfaction, evolutionary psychology	Cognitive biases lead to recurring calculation errors and reduce buyers' long-term satisfaction with their decisions.
6	Njo et al. (2019)	Indonesia	Quantitative study using a dual-process model and regression	200 housing buyers and investors	Dual motives (consumption/ investment), risk perception	Owner-occupier buyers are predominantly influenced by the endowment effect and emotional attachment, whereas investment-oriented buyers are more strongly influenced by herding behavior and availability bias.

No.	Author and year	Country/ geographical context	Research design and data collection instrument	Sample size and population	Core biases/ behavioral constructs	Key findings regarding housing decision-making
7	Susanto & Njo (2019)	Indonesia	Survey and path analysis	170 first-time homebuyers	Herding behavior, social-network and family influence	First-time homebuyers, owing to their unfamiliarity with the market, exhibit the strongest tendency to follow collective behavior and the recommendations of people around them.
8	Yang et al. (2020)	United States	Empirical time-series analysis of collective behavior	Macroeconomic data on housing prices and returns of housing funds	Herding behavior during market fluctuations	Herding intensifies at market peaks and during downturns, leading to persistent deviations of housing prices from their intrinsic values.
9	Wangzhou et al. (2021)	Pakistan/ China	Structural equation modeling with mediating variables	315 real estate investors	Regret aversion, informational cascades, risk perception, financial literacy	Risk perception mediates the relationship between regret aversion and market entry, while higher financial literacy reduces the effect of informational cascades.
10	Hoxha & Hasani (2022)	Kosovo	Quantitative study using a standardized questionnaire and nonparametric tests	212 housing investors	Overconfidence, reliance on intuition, availability, conservatism	Severe information asymmetry in an emerging market results in the dominance of information-availability biases and imitation of prices.
11	Cascão et al. (2023)	Portugal	Systematic review and synthesis of empirical evidence	Selected housing investment studies	Clustering of biases across decision-making stages (search, evaluation, holding, and selling)	Anchoring during initial evaluation and the endowment effect/loss aversion during selling create the strongest behavioral persistence in the housing market.
12	Perumandla & Bhattacharyya (2025)	India	Structural equation modeling	418 direct housing investors	Combination of rational and behavioral factors; reinvestment intention	Housing's physical heterogeneity makes psychological biases more influential than traditional risk–return criteria in decisions to reinvest.
13	Sam et al. (2025)	India	Exploratory factor analysis and regression	Housing-market buyers and investors	Heuristic errors; physical and environmental factors	Mental shortcuts directly affect transaction timing and final valuation of properties.
14	Chalil & Zidane (2026)	Indonesia	Empirical model using questionnaire data and logistic regression	520 housing applicants and investors	Financial literacy, digital real estate platforms, informational cascades	Digital platforms accelerate the search process but expose less-experienced investors to informational cascades and false excitement.

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Conflict of Interest

The authors declare that they have no financial or non-financial conflicts of interest in conducting the research or writing this article.

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