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Beyond Rationality: A Behavioural Examination of Heuristic Biases in Agartala Smart City's Real Estate Market

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ABSTRACT: This paper access how heuristic biases affect real estate investment decisions in Agartala Smart City. The study investigates the effect of heuristics bias using survey data from investors using regression analyses. The results depicts that heuristic bias have a significant impact on investment decision and investors often rely more on cognitive shortcuts than on logical reasoning. In order to have sustainable real estate investment decisions, the study highlights the need of more transparency and investor awareness. The findings add to existing knowledge on behavioral finance in the context of developing smart cities like Agartala.

Keywords: Heuristics, real estate investment, Agartala smart city, behavioural finance.

Contents

1. Introduction

Development in Indian cities has significantly accelerated in recent times, transforming the real estate markets in both metro cities and emerging cities. In 2015, government of India launched its Smart city mission to promote sustainable and technologically integrated urban development, thus changing infrastructure investment and property valuation across 100 selected cities [11]. Agartala Smart City, under this mission, has undergone massive improvements in mobility paths, drainage and sanitation projects, urban aesthetics and heritage revitalization. These developments have changed the local real estate landscape, resulting in increased investment interest from individual investors, developers, and institutional investors [19].

Real estate investment decisions often relies on parameters like expected cash flows, neighborhood, infrastructure potential, regulatory clearance and long-term urban development possibility. Classical

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theory assumes that individuals make rational decisions based on complete information [10]. However, in reality real estate market the availability of market data is often limited, fragmented or informal in upcoming markets. In such situations investors have to rely on heuristic shortcuts, that reduce cognitive exercise when investors face uncertainty or difficult choices [8]. While heuristics results in quick decision-making, they often cause in systematic biases that can affect investment outcomes [20].

In real estate sector, heuristic biases have been very common. For instance, anchoring on previous land prices influences negotiation and price expectations [2]. Similarly, representativeness bias tends to lead investors towards short-term trends as price rises in areas as indicators of sustained future growth [16]. Availability bias is very impactful in less formal markets such as those in Northeast India, where decisions are usually based on easily accessible information from brokers, friends or visible construction activities rather than tangible empirical market data [17]. Indian investors who assume their familiarity with localities also depicts overconfidence bias [14]. Studies on behavioral impacts on Smart City development shows that infrastructure announcements alone can influence speculative activity, even before project actually begins [5]. In Agartala, initiatives such as mobility corridor upgrades, flood mitigation systems and heritage area redevelopment have increased investor optimism, often resulting in investment decisions driven more by perceptions than empirical data. This can lead to an increase of heuristic biases.

Despite growing relevance of behavioural finance in real estate research, studies focusing on heuristic bias influenced investment behavior in northeastern Indian cities remain limited. Existing literature on behavioural biases mainly examines stock markets. There is a dearth of empirical research on how heuristics influences investment decisions in cities such as Agartala, where lack of data, informal pricing structures, and increased developmental expectations play significant roles.

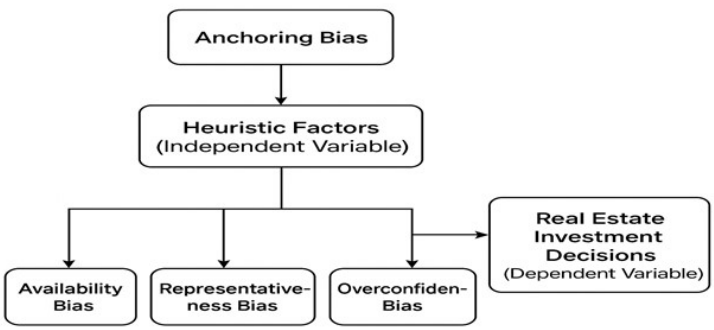

Figure 1: Effect of heuristic bias on real estate investment decisions

The study examines the extent to which heuristic biases can influence real estate investment decisions in Agartala Smart City. Understanding these behavioural nuances are paramount for increased investor awareness, improving decision-making quality, supporting sustainable development, and guiding policymaking in quick developing urban markets.

2. Problem Statement

The real estate sector of India is going through rapid transformation due to increased urbanization, infrastructural development and the implementation of the Smart Cities Mission. While cities like Bengaluru, Mumbai and Delhi have been studied extensively in terms of investment behavior, cities including those in the Northeast such as Agartala, remain significantly under-studied [17]. Agartala Smart City has experienced noticeable growth in property development [19]. This has increased land value appreciation and attracted investment interest. However, the real estate market continues to have limited transparency, incomplete market data, informal valuation practices and fragmented information.

In such cases, investors are more likely to fall for heuristic shortcuts when making decisions, relying on local easily retrievable information, or short-term trends into the future [2,16]. Behavioral finance studies states that these heuristics can lead to systematic biases, which influences decision making and cause

deviations from rational investment plans [8]. This challenge is hightened in Smart City environments, where new infra plan can create speculation pressures and investor expectations [5].

In spite of all such circumstances, there is lack of empirical studies examining how heuristic biases influence real estate investment decisions specifically within Agartala City. The lack of limited access to verified transaction data and heavy reliance on local brokers further make investment assessments complex, increasing the probability of bias driven decisions [17]. As a result, investors tends to misjudge property values, misallocate financial resources, or engage in speculative behavior that undermines sustainable urban development.

This research addresses this critical gap by investigating the extent to which heuristic factors influences real estate investment decisions in Agartala Smart City. Understanding these behavioural influences is essential for improving investment decision quality, designing informed policy interventions and for Agartala city's long-term development goals.

3. Literature Review

Behavioural finance challenges the traditional assumption that investors behave rationally and possess full access to market information. Instead, research shows that individuals rely on simplified mental shortcuts known as heuristics [8]. These heuristics help reduce cognitive effort but often produce systematic biases that influence financial and real estate choices. In property markets, in the presence of information asymmetry and valuation uncertainty, heuristic bias driven decisions become even more significant. As Tversky and Kahneman [20] states that such biases affect not only risk perception but also expectations of returns from the market.

Anchoring bias happens when investors have to rely on initial information when assessing property value or negotiating prices [4]. Previous literature shows the role of anchoring bias in real estate markets. [2] found that Indian investors make their expectations relying on outdated benchmark prices, adjusting inadequately to new market conditions. In emerging markets, anchoring becomes very influential as investors base decisions on initial project announcements, expected infrastructure improvements, or speculative price projections [5].

Availability bias refers to the tendency to rely on easily retrievable information like recent sales, visible construction, or local rumors when making investment decisions [15]. In developing Indian cities, where formal property data systems are weak, availability bias plays a central role. Sharma and Das [17] note that real estate investors in Agartala often obtain information through informal networks, resulting in decisions that lack analytical grounding. Similar findings were observed in studies of Indian Smart Cities like Indore and Surat, where investors use media campaigns and project visibility as primary indicators of property value [7].

Representativeness bias leads investors to generalize future outcomes based on perceived patterns rather than actual data [1]. In Indian real estate markets, these bias manifests when individuals assume that short-term price increases will continue indefinitely. Sarkar [16] observed that investors in small and medium Indian cities frequently chase trends, buying properties in rapidly developing areas without evaluating long-term fundamentals. In Agartala, neighborhoods near Smart Road corridors or commercial redevelopment sites have seen increased speculative investment driven by trend extrapolation rather than evidence-based analysis [17]. Overconfidence bias occurs when investors overestimate their ability to predict market movements or evaluate risks [6]. Studies of Indian investors show significant overconfidence among those familiar with local markets, particularly in Tier-II cities where emotional and cultural familiarity shape investment decisions [14]. Overconfident investors tend to underestimate market volatility and diversify less, often concentrating investments in familiar neighborhoods. In Agartala Smart City, overconfidence is evident when investors assume that Smart City projects will automatically lead to exponential price increases, despite mixed evidence from other cities [5].

Gambler's fallacy is belief that a reversal is bound to happen after a series of similar outcomes has been observed in financial and property markets. In Indian real estate, investors may incorrectly assume that stagnant prices will soon rise or that rising prices will soon correct, even without supporting data [18]. Investors in Northeast Indian cities, including Agartala, often expect cyclical reversals based on anecdotal historical fluctuations, leading to poorly timed purchases or sales [17].

The Smart Cities Mission has significantly reshaped urban planning and investment in India. Infrastructure announcements usually create psychological triggers for property speculation [5]. Studies show that Smart City branding alone can elevate price expectations and induce behavior consistent with anchoring and representativeness biases [7]. In Agartala, Smart City interventions have led to increased investor interest near redevelopment areas such as Durga Chowmuhani, Kaman Chowmuhani, and the Airport Road corridor, even before completion of the project [19].

Although extensive behavioural finance research exists for major Indian cities and stock markets, minimal empirical research focuses on real estate investment heuristics in Northeast India, including Agartala Smart City. Sharma and Das [17] highlight the urgent need for academic inquiry into behavioural biases in smaller cities where informal data structures dominate. No existing study specifically examines the combined effects of anchoring, availability, representativeness, overconfidence, and gambler's fallacy on property investment choices in Agartala. This gap underscores the importance and originality of the present research.

4. Research Methodology

4.1. Research Design

This study applies descriptive research design to examine the effect of heuristic factors on real estate investment decisions in Agartala Smart City. Descriptive designs are appropriate when the main aim is to explain relationships among variables and describe patterns within a target population [21]. Given the focus on understanding cognitive biases a descriptive approach enabled systematic examination of how these heuristics bias influence investors' decision-making processes. This design is commonly used in behavioural finance and urban investment studies where subjective perceptions and attitudes are critical [7].

4.2. Study Area

The study was conducted in Agartala Smart City, located in the state of Tripura in Northeast India. Agartala has undergone extensive transformation through Smart City Mission initiatives, including mobility corridor upgrades, drainage and sanitation improvements, heritage redevelopment zones, and digital governance infrastructure [19]. These developmental activities have spurred real estate investment, creating an ideal context for exploring behavioural influences on investment decisions.

4.3. Target Population and Sampling Procedure

The target population comprised 131 registered real estate investors in Agartala Smart City, including individual investors, small developers, and property agents involved in residential and commercial transactions. A census sampling technique was employed because the population size was manageable and accessible. Census sampling eliminates sampling error and ensures that all available investors contribute to the dataset, increasing the reliability of behavioural findings [9]. Out of 131 distributed questionnaires, 118 were completed and returned, resulting in a response rate of 93.7%, which is considered highly acceptable for survey-based research [12].

4.4. Instrumentation and Data Collection

Data were collected using a structured, self-administered questionnaire, consistent with behavioural studies where constructs must be measured quantitatively [21].
The questionnaire design was based on validated behavioural finance instruments used in prior studies [2,14].

4.5. Validity and Reliability

Validity

Content validity was ensured by consulting three experts in real estate, behavioural finance, and urban development. Their feedback ensured alignment of items with the constructs being measured.

Reliability

To test internal consistency of the heuristic measurement scale, Cronbach's alpha was calculated. The heuristic factor scale produced an alpha value of 0.727, exceeding the recommended threshold of 0.70, indicating satisfactory reliability [13]. High reliability ensures that the instrument consistently measures behavioural constructs across respondents.

4.6. Data Analysis Techniques

The data were coded, cleaned, and entered into SPSS (Statistical Package for Social Sciences) for analysis. Both descriptive and inferential statistical methods are used.

These statistics summarized heuristic patterns and investment tendencies among Agartala investors.

A simple linear regression model was used to determine how heuristic factors influence real estate investment decisions:

$$Y = \beta_0 + \beta_1 X_1 + \epsilon$$

Where:

Y = Real estate investment decision,

X_1 = Composite heuristic score,

β_0, β_1 = Regression coefficients,

ϵ = Error term.

Regression was selected because it quantifies the strength of influence between behavioural factors and investment decisions, consistent with behavioural economics research [1].

The significance level (α) set at 0.05, aligning with standard social science research practice.

4.7. Ethical Considerations

Participants were informed about the purpose of the study and assured that participation was voluntary. Responses were anonymous, and no personal identifiers were collected. Ethical considerations adhered to guidelines recommended for behavioural research involving human participants [3].

5. Results and Findings

5.1. Data Processing

All 118 returned questionnaires were checked for completeness, coded, and analysed using SPSS. Descriptive statistics summarized heuristic behaviours and investment tendencies, while inferential statistics—specifically linear regression—tested the effect of heuristic factors on real estate investment decisions in Agartala Smart City.

5.2. Descriptive Findings on Heuristic Factors

The descriptive analysis showed that respondents frequently relied on heuristic cues when making investment decisions. The findings align with prior behavioural research showing that investors in emerging markets often depend on simplified mental shortcuts where market transparency is limited [2,17].

5.3. Regression Analysis

A linear regression model was used to examine whether heuristic factors significantly influence real estate investment decisions in Agartala Smart City.

Model Summary

Table 1: Model Summary

Model	R	R-Square	Adjusted R-Square	Std. Error
1	0.247	0.061	0.053	0.939

The model has R value of 0.247, indicating a positive relationship between heuristic factors and real estate investment decisions within the confinements of Agartala city. The R-Square value of 0.061 tells that 6.1% of the variation in investment decisions can be explained through heuristics biases of the investors investing in real estate projects. Although the percentage is low, it is normal for behavioural finance studies, where human decision is influenced by many psychological and contextual factors.

ANOVA Test

Table 2: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	86.670	1	6.670	7.567	0.007
Residual	22.254	116	0.881		
Total	108.924	117			

The ANOVA results indicates that the regression model is statistically significant at the 5% level of significance.This confirms that heuristic factors meaningfully predict variations in real estate investment decisions among investors in Agartala Smart City.

Regression Coefficients

Table 3: Regression Coefficients

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
Constant	3.233	0.301	—	10.753	0.000
Heuristic Factors	0.215	0.078	0.247	2.751	0.007

The regression equation is: $Y = 3.233 + 0.215\ X_1$

Where:

Y = Real estate investment decision score,

X_1 = Heuristic factors score,

Heuristic bias significantly influences investment decisions. Investors who rely more heavily on heuristics are more likely to make corresponding investment decisions in Agartala Smart City.

5.4. Findings

The findings demonstrate that heuristic factors play a meaningful role in real estate investment behavior within Agartala Smart City. This matches previous literature with behavioural finance theories, which argue that when markets lack transparency investors often make decisions using cognitive shortcuts [8].

6. Conclusion

In Agartala Smart City, a quickly growing urban center under India's Smart Cities Mission, this study investigated the impact of heuristic factors on real estate investment decisions. The results showed that heuristics significantly influence investment judgment in the city's real estate markets, based on data collected from 118 registered investors. Regression analysis revealed a positive and statistically significant relationship between heuristic factors and investment decisions, suggesting that behavioral biases significantly influence how investors evaluate opportunities, estimate property values, and decide whether to buy or sell. Cognitive shortcuts continued to affect respondents' decision-making processes despite their high levels of experience, supporting findings from behavioral finance literature that indicate cognitive biases endure even among seasoned investors. Given the lack of transparency of property price data, the absence of digital valuation systems, and over reliance on informal information channels, investors in Agartala often have to rely on simplified decision strategies. These can result in mispricing, speculative investment, and inefficient allocation of financial resources. The study therefore highlights the need for enhanced data availability, investor education, and policy interventions that support more rational and informed decision-making practices.

Declarations

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