

Measuring Behavioral Biases in SME Investment Decisions: A Scale Development Study

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Abstract

This study aims to develop and validate a behavioral bias scale tailored for financial decision-makers in small and medium-sized enterprises (SMEs). The research identifies nine key biases—anchoring, loss aversion, self-control, regret avoidance, endowment effect, status quo bias, conservatism, familiarity bias, and confirmation bias—and examines their role in investment decision-making. A mixed-method approach was employed, beginning with a literature review and qualitative interviews with SME managers to refine scale items. The final scale, consisting of 34 items, was tested through exploratory factor analyses using data from 334 participants. The results confirmed the scale’s reliability and initial validity, demonstrating strong internal consistency through exploratory factor analysis (EFA). The validated scale serves as a foundation for further research and practical applications aimed at mitigating biases in financial decision-making.

Keywords: Behavioral biases, behavioral finance, financial decision-making, SMEs, investment decisions, scale development, behavioral corporate finance

Introduction

Decision-making in financial investments is a critical aspect of firm management, often assumed to be based on rational and objective assessments. However, behavioral finance research suggests that cognitive and emotional biases significantly influence investment decisions, leading to suboptimal financial outcomes (Madaan and Singh, 2019). Managers often exhibit various biases that shape their investment decisions, deviating from purely rational decision-making processes. These biases can lead to strategic errors, inefficient resource allocation, and missed investment opportunities (Barnes, 1984). By identifying and understanding these biases, firms can develop strategies to mitigate their effects, improving decision-making processes and overall firm performance.

This study focuses on identifying which cognitive and emotional biases influence the investment decisions of key decision-makers in SMEs. The biases under investigation include anchoring, loss aversion, self-control, regret avoidance, endowment effect, status quo bias, conservatism, familiarity bias, and confirmation bias. Anchoring bias leads managers to overemphasize initial information when making financial decisions, potentially resulting in misleading valuations. Loss aversion can drive decision-makers to avoid high-risk investments that may offer significant long-term gains. Similarly, excessive self-control may prevent managers from taking necessary financial risks, whereas regret avoidance bias may cause them to choose overly conservative strategies. Additionally, biases such as the endowment effect and status quo bias can result in resistance to change and delayed adaptation to market innovations. Other biases, such as conservatism, familiarity bias, and confirmation bias, further contribute to the distortion of rational decision-making, influencing investment choices in ways that may not align with optimal financial strategies (Flyvbjerg, 2021; Mittal, 2022). These biases were selected based on their presence in interviews with managers, their relevance in investment decisions, and findings from the literature review.

Existing literature indicates a gap in behavioral finance research concerning managerial decision-making in firms. While various biases have been explored in individual investment contexts (Jain et al., 2021; Singh, 2021) there is limited research on how these biases impact corporate decision-makers. Additionally, there is no comprehensive scale specifically developed to measure the presence and impact of these biases among managers. To address this gap, this study follows a structured scale development process, incorporating insights from the literature and qualitative interviews with SME owners and executives. These interviews provided an understanding of how investment decisions are made and how behavioral biases manifest in practice. The resulting scale allows for a systematic assessment of managerial biases and their implications for investment decisions.

The scale development process followed established methodologies, including exploratory factor analysis (EFA), to ensure reliability and validity. A total of 334 decision-makers from SMEs participated in the study, providing a robust dataset for analysis. The exploratory factor analysis revealed a well-structured factor model with strong internal consistency across identified biases. The Kaiser-Meyer-Olkin (KMO) measure confirmed sample adequacy, while Bartlett's test indicated factorability of the dataset. Factor loadings for all items exceeded 0.6, demonstrating strong construct validity. Additionally, Cronbach's Alpha values across all identified factors were above 0.80, reinforcing the scale's reliability. Following the EFA results, confirmatory factor analysis (CFA) will be conducted in the next phase to further validate the factor structure and assess model fit. The CFA will employ fit indices such as RMSEA, CFI, and TLI to determine the robustness of the scale. These statistical validations

confirm that the developed scale effectively captures the presence and impact of cognitive and emotional biases among SME decision-makers.

By examining the awareness and influence of biases among financial decision-makers, this study contributes to both theoretical and practical discussions in behavioral corporate finance. The findings offer valuable insights into improving decision-making processes, enhancing firm competitiveness, and developing strategies to mitigate cognitive and emotional biases in financial decision-making. Unlike previous studies that often focus on a limited set of biases, this research examines multiple biases simultaneously, providing a broader and more integrated perspective on how these biases interact and collectively influence investment decisions.

Ultimately, this study advances the behavioral and corporate finance literature by offering a novel perspective on decision-making biases among SME managers. From a practical standpoint, it provides firms with a structured framework to measure and address behavioral biases, facilitating more rational investment decisions in an increasingly complex financial environment. Additionally, by establishing a robust measurement tool, this research lays the groundwork for future studies and managerial practices aimed at optimizing financial decision-making and minimizing bias-driven inefficiencies.

Theoretical Background

Managers and Financial Decisions

Financial decision-making is a fundamental aspect of business management, encompassing how firms acquire and allocate financial resources to sustain operations and enhance firm value (Bella, Apriyanti and Sriwijayanti, 2023). Traditionally, finance has been categorized into three main branches: personal finance, corporate finance, and public finance. Within corporate finance, managerial financial decisions play a crucial role in ensuring profitability, sustainability, and long-term growth (Tyson, 2023; Tresch, 2022; Vernimmen, Quiry and Le Fur, 2022). These decisions broadly fall into three categories: investment decisions, capital structure (financing) decisions, and dividend distribution decisions (Hasanuddin, 2021). The effectiveness of these financial decisions directly impacts firms' competitiveness, risk exposure, and overall market value. Despite extensive research on corporate finance strategies, there is still no definitive answer to how financial decisions are made in real-world business settings, especially in small and medium-sized enterprises (SMEs), where resource constraints and managerial biases may have a greater influence.

Among these financial decisions, investment decisions are particularly crucial as they shape the future trajectory of firms and involve complex considerations of risk, return, and uncertainty. Investment choices dictate a firm's ability to expand operations, adopt new technologies, and sustain long-term profitability. These decisions require balancing short-term financial constraints with long-term strategic goals, making them one of the most challenging aspects of corporate financial management (Nicolas, 2022).

While traditional financial models assume rational decision-making, behavioral finance suggests that cognitive and emotional biases significantly impact investment choices, sometimes leading to suboptimal outcomes (Mohammadi, 2024). The complexity of investment decisions is further compounded by external factors such as market volatility, inflation, interest rate fluctuations, and global economic shifts. These variables create an

unpredictable financial landscape, increasing the likelihood that managers will rely on heuristics and biases when making investment choices (Dhungana et al., 2022). Given that investment choices directly affect firm growth and financial sustainability, understanding how managerial biases influence these decisions is essential for improving financial decision-making frameworks.

Behavioral Finance

Behavioral finance has emerged as a critical paradigm shift in financial decision-making, challenging the traditional notion of rationality and market efficiency assumed by classical finance theories (Tversky and Kahneman, 1974; Shefrin, 2002). Unlike conventional models that presume investors and managers act in their best economic interests by processing all available information objectively, behavioral finance incorporates insights from psychology, sociology, and cognitive sciences to explain why financial decisions often deviate from optimal strategies (Thaler, 1999; Ricciardi, 2005).

One of the foundational theories of behavioral finance is prospect theory, introduced by Kahneman and Tversky (1979), which illustrates that individuals evaluate gains and losses asymmetrically. This means that decision-makers tend to fear losses more than they appreciate equivalent gains, often leading to risk-averse or risk-seeking behaviors depending on how choices are framed. Unlike expected utility theory, which assumes a consistent approach to risk, prospect theory highlights how subjective perceptions, and psychological factors influence financial decision-making.

Behavioral finance also explains why financial markets often experience inefficiencies, anomalies, and speculative bubbles that contradict the efficient market hypothesis (Fama, 1970). Market participants frequently display herd behavior, follow trends irrationally, and exhibit irrational exuberance or panic during market fluctuations (Bikhchandani and Sharma, 2000). This has been evident in major financial crises, where fear and uncertainty have led to irrational decision-making, reinforcing the argument that financial markets are not always driven by fundamental values but rather by psychological and social influences (Camerer and Loewenstein, 2006).

While much of behavioral finance research initially focused on individual investors, recent studies highlight its relevance to corporate finance and managerial decision-making (Guenzel, and Malmendier, 2020; Baker and Wurgler, 2004). Corporate executives, financial managers, and board members are also prone to biases, which influence capital budgeting, mergers and acquisitions, and investment policies (Gervais, Heaton and Odean, 2011). The role of behavioral corporate finance has thus gained prominence, emphasizing how managers' cognitive and emotional biases affect firm-level financial decisions, risk-taking, and corporate governance (Ben-David, Graham and Harvey, 2013).

This field is grounded in the understanding that decision-makers are not purely rational agents but are influenced by cognitive limitations, emotions, and social pressures (Shiller, 2003). Behavioral finance suggests that individuals rely on mental shortcuts (heuristics) when making financial decisions, leading to systematic biases that affect investment behavior, risk assessment, and corporate strategies (Ahmad and Wu, 2024). Empirical studies have demonstrated that biases such as overconfidence, loss aversion, herding behavior, and anchoring often drive financial choices in ways that contradict rational expectations (Zahera and Bansal, 2018).

Given the growing evidence that financial decision-making is shaped by both rational analysis and psychological influences, behavioral finance has become an essential framework for understanding why managers deviate from standard financial theories in practice. This study builds upon this perspective by examining how cognitive and emotional biases impact investment decisions within SMEs, offering empirical insights into managerial behavior beyond traditional economic models. The following section will further explore specific biases and their implications for financial decision-making.

Behavioral Biases in Financial Decision-Making

Behavioral biases play a crucial role in shaping financial decision-making, often leading individuals and managers to deviate from rational choices. These biases can be categorized into cognitive biases, which stem from errors in information processing and statistical misjudgments, and emotional biases, which are driven by psychological impulses and affective states (Pompian, 2012a). Cognitive biases, such as anchoring, conservatism, confirmation bias, and status quo bias, cause individuals to rely excessively on initial information, pre-existing beliefs, or habitual decision patterns, often ignoring new evidence and resisting change. Emotional biases, including loss aversion, self-control bias, regret avoidance, endowment effect, and familiarity bias, lead individuals to make decisions based on fear of loss, emotional attachment to past choices, preference for known options, or the avoidance of regret, rather than objective financial assessments (Pompian, 2012b; Shefrin, 2002). The distinction between these two types of biases is critical in understanding the systematic deviations from rationality that affect investment decisions.

Anchoring Bias

Anchoring bias occurs when individuals rely too heavily on initial reference points when making financial decisions, even when new information suggests that adjustments should be made (Tversky and Kahneman, 1974). In investment decision-making, managers often base their financial evaluations on historical price levels, initial investment costs, or first offers in negotiations, rather than current market conditions. This reliance on outdated or irrelevant anchors can distort asset valuation and lead to poor financial planning. For example, a manager may be reluctant to sell a declining stock because its initial purchase price serves as a psychological anchor, despite market conditions indicating that selling is the best option (Montier and Strategy, 2002).

In corporate finance, anchoring bias can also affect budget allocation and capital investment decisions. Decision-makers may be influenced by previous project costs or outdated financial forecasts, causing them to stick with suboptimal investment plans rather than adapting to new information (Epley and Gilovich, 2006). This bias can lead to overinvestment in failing projects or missed opportunities for growth, particularly in SMEs where financial flexibility is crucial. Overcoming anchoring bias requires decision-makers to critically assess current data and avoid excessive reliance on past benchmarks that no longer reflect market realities.

Loss Aversion Bias

Loss aversion, a central principle of prospect theory, refers to individuals' tendency to weigh losses more heavily than equivalent gains (Kahneman and Tversky, 1979). This bias leads investors and managers to avoid risks, even when potential returns outweigh the perceived downside. For instance, a manager may reject an investment opportunity with a high expected return simply because the possibility of a minor loss outweighs the potential gains in their perception (Thaler, 1999).

In corporate finance, loss aversion manifests in decision-makers' reluctance to exit failing projects, fearing the psychological pain of admitting a financial loss. This leads to escalation of commitment, where firms continue investing in unprofitable ventures to avoid acknowledging past mistakes (Chrisman and Patel, 2012). Additionally, risk-averse behavior may result in excessive conservatism in portfolio management, causing firms to miss high-return investment opportunities. Addressing loss aversion requires managers to adopt a long-term perspective and consider risk-return trade-offs based on objective financial analysis rather than emotional responses to short-term losses.

Self-Control Bias

Self-control bias refers to individuals' struggle to balance immediate desires with long-term financial goals, often leading to impulsive decision-making (Hofmann, Friese and Strack, 2009). In financial management, this bias can result in excessive short-term spending, under-saving, or failing to adhere to structured investment plans. Managers may prioritize immediate cash flow concerns over long-term capital investments, potentially undermining firm growth.

Within SMEs, self-control bias can hinder strategic investment decisions by causing managers to focus disproportionately on short-term profitability rather than sustainable development. For example, a company may choose not to invest in new technology due to immediate cost concerns, despite the long-term benefits of increased efficiency and competitiveness (Odean, 1998). Effective financial planning and structured investment frameworks can help mitigate self-control bias by ensuring that financial decisions align with broader strategic objectives.

Regret Aversion Bias

Regret aversion bias arises when individuals avoid making decisions that could lead to future regret, often resulting in excessive conservatism in investment choices (Sukamulj, Meilita and Senoputri, 2019). Investors and corporate managers may hesitate to take action due to the fear of making a wrong decision, leading to missed opportunities or an overreliance on familiar investment strategies.

This bias is particularly evident in financial downturns, where managers may refuse to divest from underperforming assets due to regret aversion, even when strategic adjustments are necessary (Lari et al., 2023). In SMEs, regret aversion can lead to excessive reliance on traditional business models, preventing firms from adopting innovative financial strategies. Encouraging adaptive decision-making and fostering a corporate culture that views failure as a learning experience can help mitigate the impact of regret aversion bias.

Endowment Effect

The endowment effect describes individuals' tendency to overvalue assets they already own, leading to irrational financial decisions (Kahneman, Knetsch and Thaler, 2008). This bias causes managers to assign higher value to existing investments or business assets than their actual market worth, resulting in inefficient capital allocation.

For instance, corporate executives may refuse to sell an underperforming division simply because of emotional attachment, despite evidence that reallocating resources elsewhere would be more beneficial (Kahneman, Knetsch and Thaler, 1991). The endowment effect can also lead to resistance to mergers and acquisitions, as managers overestimate the value of their firms and reject profitable buyout offers. To counteract this bias, financial decision-makers should conduct objective valuations and seek external assessments to ensure rational decision-making.

Status Quo Bias

Status quo bias occurs when individuals prefer maintaining existing conditions rather than making changes, even when alternative options offer better financial outcomes (Samuelson and Zeckhauser, 1988). In corporate finance, this bias often results in resistance to innovation, reluctance to adopt new investment strategies, and the continuation of outdated financial policies.

Managers exhibiting status quo bias may avoid entering new markets or adopting technological advancements due to perceived uncertainties, potentially hindering business growth (Polites and Karahanna, 2012). This is particularly problematic in SMEs, where adaptability is crucial for survival in competitive markets. Encouraging dynamic decision-making and fostering a culture of continuous improvement can help organizations overcome status quo bias and embrace strategic change.

Conservatism Bias

Conservatism bias leads individuals to underreact to new information, favoring existing beliefs or outdated data even when compelling evidence suggests adjustments should be made (Wu, Wu and Liu, 2009). This bias results in slow responses to market changes, outdated investment strategies, and reluctance to incorporate emerging financial trends.

For example, a company may fail to adjust its financial forecasts despite clear signs of economic shifts, resulting in suboptimal resource allocation (Barberis, Shleifer and Vishny, 1998; Paeleman, Vanacker and Zahra, 2023). Overcoming conservatism bias requires organizations to integrate real-time data analysis and emphasize evidence-based financial decision-making.

Familiarity Bias

Familiarity bias occurs when decision-makers prefer investments in well-known assets or markets, even when unfamiliar opportunities offer better returns (De Vries, Erasmus and Gerber, 2017; Foad, 2010). Managers often favor local markets or industries they understand, potentially leading to under-diversification and risk concentration.

In SMEs, this bias may result in limited expansion efforts, as firms stick to known industries instead of exploring innovative business models. Encouraging broader market research and exposure to diverse investment options can help mitigate familiarity bias.

Confirmation Bias

Confirmation bias leads individuals to seek information that supports their pre-existing beliefs while ignoring contradictory evidence (Nickerson, 1998). In financial decision-making, this bias can cause managers to disregard warning signs of failing investments, reinforce flawed assumptions, and resist adapting strategies.

For instance, a manager convinced of a particular investment's success may selectively interpret data that supports this belief, ignoring potential risks (Park, Cho and Kim, 2021). Implementing structured decision-making frameworks that require the consideration of alternative perspectives can help reduce the impact of confirmation bias in corporate finance.

Methodology

This study employs a mixed-methods approach, integrating both quantitative and qualitative data collection techniques to investigate the presence and impact of behavioral biases in the investment decisions of managers and owners of small and medium-sized enterprises (SMEs) in Turkey, as well as to develop a scale for measuring these biases. Given the complex nature of financial decision-making, a mixed-methods design allows for both a broad statistical assessment through surveys and a deeper contextual exploration through interviews. This approach ensures a comprehensive understanding of how cognitive and emotional biases influence investment decisions in SMEs.

Since data collection occurs within a specific timeframe, this study follows a cross-sectional research design and the unit of analysis is at the individual level, as the research focuses on SME owners and financial managers who are directly involved in investment decisions.

Sample Selection

The study focuses on SMEs because, unlike large corporations where financial decisions are typically made by board committees, in SMEs, investment decisions are primarily taken by a small group of key individuals, such as owners, partners, or senior financial executives. This concentrated decision-making structure makes SMEs ideal for analyzing the direct impact of behavioral biases on financial choices.

SMEs play a crucial role in the global economy, representing approximately 90% of businesses and more than 50% of employment worldwide. They also contribute up to 40% of GDP in emerging economies (World Bank, 2023). In OECD countries, SMEs account for 99% of all firms and generate 50-60% of value added (OECD, 2021). Their significance extends to innovation, job creation, and economic resilience, making them vital to sustainable economic growth. Their role in economic development has been increasingly recognized, making it critical to understand how behavioral biases shape investment decisions in these firms.

The study follows Turkey's official definition of SMEs, set by KOSGEB (Small and Medium Enterprises Development Organization). SMEs are defined as firms:

- With fewer than 250 employees
- Meeting certain financial criteria in terms of annual revenue and total assets

According to the Turkish Statistical Institute (TÜİK, 2023), SMEs constitute 99.7% of all enterprises in Turkey. They account for 72.0% of total employment, 44.1% of total turnover, and 40.4% of total production value. These figures highlight the crucial role of SMEs in the Turkish economy. Additionally, in the industry and service sectors, 3,713,000 enterprises are classified as SMEs. This provides a large population for potential sampling.

In research, the study population is referred to as the "universe," while the selected subset for analysis is called the "sample" (Marshall, 1996). A sample is a representative selection drawn from the population using defined criteria (Robinson, 2014). Sampling methods are classified into two categories:

- Probability Sampling: Each unit has a known probability of selection, enhancing generalizability.
- Non-Probability Sampling: Selection is based on predefined criteria, often used when probability sampling is impractical (Setia, 2016).

Although probability sampling is preferred for maximizing generalizability, this study adopts a non-probability purposive sampling approach to ensure that participants have direct experience in SME investment decisions. This method allows for a focused analysis of financial biases, ensuring that responses are both relevant and contextually meaningful. The research population consists of financial and accounting managers, business owners, and partners involved in investment decisions within SMEs. According to Yaşlıoğlu (2017), the ideal sample size should be at least five times the number of items in the scale. Given that the final scale contained 34 items, a minimum of 170 participants was required.

The sample includes two groups:

1. Interview Participants (Qualitative) – A smaller subset of SME owners and financial managers, selected for in-depth qualitative interviews to explore real-world financial decision-making behaviors.
2. Survey Respondents (Quantitative) – SME decision-makers from various industries, recruited via online surveys. Data collection was conducted through online surveys (Google Drive, LinkedIn, and email).

Scale Development and Data Collection

A structured scale was developed to measure behavioral biases in SME investment decision-making, following DeVellis' scale development framework. The process involved a literature review to identify key biases, expert evaluations to refine items, and a pilot study to assess clarity and reliability. Exploratory and confirmatory factor analyses will be conducted on two to validate the scale, ensuring strong reliability and model fit (DeVellis and Thorpe, 2021). This systematic approach established a theoretically grounded and empirically validated instrument for assessing behavioral biases in financial decision-making.

The research followed a structured methodology, as outlined in Table 1. The key steps undertaken include conducting a comprehensive literature review, qualitative research through in-depth interviews and expert consultations, and quantitative research comprising pre-research, pilot testing, and factor analysis. The final stages of the research, including Steps 7, 8, and 9, will be conducted later. These include confirmatory factor analysis, assessing relationships with an other variable to test the model in the developed study and further validation of the scale. These steps are also presented in Table 1.

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To measure behavioral biases in investment decision-making, a structured scale instrument was developed. This process involved multiple steps to ensure the scale's validity and reliability:

Step 1: Literature Review and Item Generation

A comprehensive literature review was conducted to identify the nine key behavioral biases most relevant to investment decision-making in SMEs. These biases include anchoring bias, where individuals rely too heavily on initial information; loss aversion bias, which leads to a stronger preference for avoiding losses rather than making gains; self-control bias, which reflects difficulties in resisting short-term temptations for long-term benefits; and regret aversion bias, where individuals avoid decisions that might lead to future regret. Additionally, the endowment effect causes people to overvalue assets they own, while status quo bias leads to a preference for maintaining current conditions rather than making changes. Conservatism bias results in individuals holding onto prior beliefs despite new evidence, familiarity bias causes a preference for known options over unfamiliar ones, and confirmation bias leads to the tendency to seek and interpret information that supports existing beliefs.

These biases were examined through books, peer-reviewed journal articles, and financial reports to form a conceptual framework. Based on existing scales and theoretical models, an initial pool of 30 statements was developed to assess whether managers exhibit these biases in investment decisions.

Step 2: Qualitative Interviews and Scale Refinement

To ensure the cultural and contextual relevance of the scale statements, semi-structured in-depth interviews were conducted with seven SME owners and financial managers in Istanbul. These interviews aimed to explore:

- How SME managers make investment decisions
- Key challenges they face
- Factors influencing financial choices, including external pressures
- Whether they recognize biases in their decision-making

Key themes that emerged included the influence of family networks, social reputation in investment decisions, and the difficulty of changing financial strategies despite new information. Table 2 presents the demographic and professional details of the interview participants.

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Based on these insights, nine new statements were added to the initial pool, bringing the total to 39 statements. However, to eliminate redundancy, merging similar items resulted in a refined draft of 36 statements.

Step 3: Expert Evaluation

The draft scale was reviewed by two finance professors and three experts, who assessed the clarity of statements, the relevance of the items to behavioral biases, and their applicability to SMEs. Following expert feedback, two statements were removed, leaving a final scale consisting of 34 statements.

Step 4-5-6: Quantitative Research and Scale Validation

To ensure the validity and reliability of the scale, a multi-phase quantitative research process was conducted. First, a pre-research study was carried out with 10 participants, followed by a pilot study involving 35 SME executives to assess content, language, and face validity. Next, an online scale was administered to 334 participants to explore the factor structure through Exploratory Factor Analysis (EFA). Finally, construct validity and internal consistency were evaluated by analyzing the relationship of items with the total scale and testing Cronbach's Alpha values for reliability. The findings related to these quantitative analyses will be presented in the findings section.

Findings

Pilot Study

The pilot study aimed to test the reliability and validity of the scale before conducting a full-survey data collection, which also included demographic information. A preliminary test was conducted with 10 participants to ensure clarity, relevance, and ease of understanding of the scale items. The average completion time was recorded as 10 minutes, confirming that the survey was not excessively long or short, which is crucial for obtaining valid responses.

Following this, a pilot study was conducted with 35 firm managers to evaluate the reliability of the scale. The Cronbach's Alpha coefficient was calculated at 0.835, indicating a high level of internal consistency and reliability. In psychological and behavioral research, a Cronbach's Alpha value above 0.70 is generally considered acceptable, and values above 0.80 indicate strong reliability (Seçer, 2013). These findings suggested that the scale was well-structured and consistent in measuring behavioral biases.

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Since the Cronbach's Alpha coefficient was above 0.80, the scale was considered highly reliable. After confirming reliability, validity tests were conducted to examine whether the scale measured a single construct. Correlation analysis was performed, and based on Tabachnick, Fidell and Ullman (2007), factor analysis was deemed appropriate if correlation coefficients exceeded 0.30. The results confirmed that the dataset was suitable for analysis.

Exploratory Factor Analysis (EFA)

A total of 525 individuals were invited to participate, but due to incomplete responses, survey fatigue, and dropout rates, 191 responses were excluded, resulting in 334 fully completed surveys for analysis. This final sample size was considered sufficient for conducting factor analysis and statistical validation. To evaluate the construct validity of the scale, Exploratory Factor Analysis (EFA) was conducted. The correlation matrix of items was analyzed to confirm factorability, using the following tests:

- Kaiser-Meyer-Olkin (KMO) Test: Measures sampling adequacy (values > 0.80 indicate good adequacy).
- Bartlett's Test of Sphericity: Tests if the correlation matrix is factorable (significance $p < 0.05$ required for factor analysis).

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The KMO measure confirmed sample adequacy, with a value of 0.854, which falls within the "good" range (0.80–0.90) (Çokluk, Şekercioğlu and Büyüköztürk, 2012). The Bartlett's test of sphericity yielded a significant chi-square value ($p < 0.001$), indicating that the correlation matrix was suitable for factor analysis.

Normality Testing

To ensure that the scale met the assumptions of normal distribution, Kolmogorov-Smirnov and Shapiro-Wilk tests were performed. The results indicated that the behavioral bias items did not follow a perfectly normal distribution ($p < 0.05$). However, skewness and kurtosis values remained within the acceptable range of -2 to +2 (George, 2011), which allowed for further statistical analyses.

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The skewness values indicate whether the data distribution is symmetrical or skewed. Values between -2 and +2 are considered acceptable for normality (George, 2011). Here, all skewness values fall within this range, suggesting an acceptable level of distribution symmetry. The kurtosis values measure the "tailedness" of the distribution. Values between -2 and +2 indicate an acceptable distribution shape. The kurtosis values in the table suggest that the distributions of all bias-related statements are well within the normal range. While the Kolmogorov-Smirnov and Shapiro-Wilk tests indicated non-normality at $p < 0.05$, the skewness and kurtosis values confirm that the dataset is still usable for parametric tests. This supports the assumption that the scale items for measuring behavioral biases are approximately normally distributed, allowing for further statistical analyses such as exploratory and confirmatory factor analysis. Although the normality tests suggested deviation from a perfect normal distribution, skewness and kurtosis values remained within acceptable limits, supporting the validity of subsequent analyses.

Factor Extraction and Rotation

The factor model was estimated using the Unweighted Least Squares (ULS) method. To determine the appropriate number of factors, the Kaiser (1960) and Guttman (1954) rule was considered. According to this rule, only factors with eigenvalues greater than 1.00 were included in the evaluation, as they are measured reliably (Kaiser, 1960). Subsequently, Cattell's Scree Plot Test was used to identify the point where the slope between successive

eigenvalues decreases as the number of factors increases. The number of factors was then determined based on theoretical interpretability (Cattell, 1966).

To achieve a conceptually meaningful and interpretable simple structure, the varimax rotation method was applied as one of the factor rotation techniques (Kaiser, 1958). The Principal Axis Factoring (PAF) method was chosen as the factor extraction technique. In this method, the criterion for the significance of the item-factor relationship is that the absolute value of the standardized factor loading should be 0.40 or greater (Matsunaga, 2010). The Principal Axis Factoring method focuses on eliminating errors and specific variances from the factor structure to be measured and works with shared variances (Suhr, 2005). Accordingly, to test the suitability of the scale for factor analysis, KMO and Bartlett's tests were conducted for each bias.

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The KMO values for the measured biases were found to be 0.817, 0.828, 0.814, 0.786, 0.727, 0.708, 0.834, 0.852, and 0.539, and Bartlett's test was statistically significant. Given the low KMO value for confirmation bias, the dataset was still deemed suitable for factor analysis.

The priority in the initial analysis was to examine the communalities table, which indicates the proportion of variance in each statement explained by the extracted factors. A value below 0.50 suggests that the statement should be removed from the factor analysis (Stevens, 2012). In the first step of the factor analysis, the first statement of confirmation bias had a communality value below 0.50 but was retained since confirmatory factor analysis requires a minimum of three items per factor; it was planned to be removed in the second stage if necessary. The fifth statement of familiarity bias (0.446), the third statement of regret aversion bias (0.481), and the fourth statement of self-control bias (0.432) were slightly below the 0.50 threshold but were retained since their values were not significantly lower. In a similar vein, although the KMO value for the confirmation bias subscale (0.539) was relatively low, it was retained due to its strong theoretical relevance in SME investment decisions. As a well-established cognitive bias in behavioral finance, its inclusion was considered essential. Future research will aim to refine the subscale through item revision and pilot testing to improve its psychometric robustness.

The varimax rotation method was applied to obtain the most interpretable factor structure by maximizing the differentiation between factors (Kaiser, 1958). The rotated factor matrix showed that no items had factor loadings below 0.40 or had high cross-loadings on multiple factors (Stevens, 2002). This indicates that the factors were sufficiently distinct, confirming the reliability and validity of the analysis results.

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Next Steps: Confirmatory Factor Analysis (CFA)

After successfully conducting Exploratory Factor Analysis (EFA), the next step is to validate the identified factor structure using Confirmatory Factor Analysis (CFA). This process will involve collecting new data and testing the model fit through indices such as:

- Reliability tests
- Chi-square (χ^2/df)

- Comparative Fit Index (CFI)
- Root Mean Square Error of Approximation (RMSEA)
- Standardized Root Mean Square Residual (SRMR)

The CFA results will further confirm the scale's validity and reliability in measuring behavioral biases in financial decision-making.

Discussion

The primary objective of this study was to develop and validate a behavioral bias scale specifically tailored for financial decision-makers in small and medium-sized enterprises (SMEs). Developing a reliable and valid scale is a fundamental step in empirical behavioral finance research, ensuring that psychological constructs are accurately measured and interpreted. Scale development provides a systematic approach to quantifying complex behavioral tendencies, offering standardized instruments that enhance replicability, comparability, and theoretical integration across studies (Lamm, Lamm and Edgar, 2020). Without well-developed and validated scales, research findings risk being influenced by measurement errors, limiting their applicability in academic, policy, and managerial decision-making contexts.

The scale development process followed a rigorous methodology, integrating both qualitative and quantitative research techniques. Through a comprehensive literature review, 30 initial items were identified, which were subsequently expanded to 39 after in-depth interviews with seven SME managers. These interviews highlighted culturally and contextually significant aspects of financial decision-making in Turkey, such as the influence of social networks, family structures, and reputational concerns on investment choices. This is consistent with Kumar and Goyal (2016), who argue that financial decision-making is shaped not only by rational analysis but also by cognitive biases, heuristics, and market conditions, which influence investment behaviors in complex ways. Similarly, Ayhan (2019) highlights that financial decision-making in Turkey is influenced by structural economic dynamics and financial literacy levels, further reinforcing the role of behavioral biases in shaping managerial choices. Our findings align with these perspectives, particularly in demonstrating how anchoring, loss aversion, self-control, conservatism, and familiarity bias significantly impact investment decisions among SME managers, often leading to risk-averse behavior and resistance to change.

Expert evaluations refined the scale to 34 items, ensuring clarity, relevance, and applicability. Then a pilot study with 35 SME managers confirmed the reliability of the scale, yielding a Cronbach's alpha coefficient of 0.835, demonstrating strong internal consistency. The full-scale data collection involved 334 SME decision-makers, and an Exploratory Factor Analysis (EFA) confirmed the construct validity of the scale. The Kaiser-Meyer-Olkin (KMO) measure of 0.854 and a significant Bartlett's test of sphericity validated the suitability of the dataset for factor analysis. Additionally, factor loadings exceeded 0.40, reinforcing the construct validity of the identified biases.

By focusing on anchoring, loss aversion, self-control, regret avoidance, endowment effect, status quo bias, conservatism, familiarity bias, and confirmation bias, the study aimed to provide an empirical foundation for understanding how these biases manifest in investment decisions. In behavioral finance, decision-making is influenced by a combination of cognitive and emotional biases, making single-variable studies insufficient to capture the full

complexity of investor and managerial behavior (Jain et al., 2022). This necessitates the development of multi-dimensional scales that can assess multiple biases simultaneously, ensuring that the interplay between these biases is adequately captured. Traditional behavioral finance research has often examined single biases in isolation, but recent studies argue that real-world financial decision-making is shaped by the co-existence and interaction of multiple biases (Morgado et al., 2017).

Behavioral biases do not operate in isolation; rather, they interact and reinforce one another, leading to systematic distortions in financial decision-making. For example, anchoring bias may reinforce conservatism bias, as decision-makers anchored to an initial price may resist updating their beliefs based on new information. Similarly, loss aversion and status quo bias can work together, making individuals more likely to hold onto unprofitable investments to avoid realizing losses (Davydenko, Wasilewska and Kliuchka, 2023). Recent research has emphasized that measuring multiple biases within a single scale improves predictive accuracy and applicability in behavioral finance studies (Boateng et al., 2018). Instead of assessing biases separately, a multi-bias scale allows researchers to observe patterns of biases, enabling a more nuanced understanding of financial behaviors. This is particularly relevant for SME managers, whose investment decisions are often driven by a combination of heuristic-based judgments and risk-averse tendencies (Ali, 2024).

Moreover, in corporate financial decision-making, biases such as confirmation bias, conservatism bias, and the endowment effect can collectively shape risk-taking behavior and capital allocation strategies. By developing a comprehensive behavioral bias scale, this study aligns with recent methodological advancements that promote rigorous psychometric validation in financial research (Kanten and Arda, 2020).

Additionally, this study extends the application of behavioral finance theory to SME financial decision-making, addressing the gap in research that primarily focuses on individual investors. Given that SME managers often make investment decisions under conditions of uncertainty and resource constraints, understanding how multiple biases interact is essential for designing better financial strategies and managerial training programs (Davydenko et al., 2023). Our findings support this by demonstrating that biases such as anchoring and status quo bias significantly impact SME financial decision-making. Our findings align with prior work that emphasizes the significance of cognitive and emotional biases in shaping financial behavior (Khare and Kapoor, 2024).

Recent studies emphasize that managerial biases play a critical role in shaping financial decision-making in firms, influencing key areas such as investment strategies, capital structure, and financing decisions (Hackbarth, 2008; Zahera and Bansal, 2018; Ahmadi, Mohammadi and Mokhtab Rafei, 2023). While these biases have been widely examined in corporate finance, they are particularly pronounced in SMEs, where decision-making is often centralized, and investment choices are shaped by individual psychological tendencies rather than structured, collective decision-making frameworks.

In this context, Baker, Kumar, and Singh (2018) highlight that SME owners are especially prone to self-attribution, overconfidence, and loss aversion, leading them to overestimate their own judgment, take excessive or insufficient risks, and resist adjusting their financial strategies despite market shifts. Our findings align with these insights, revealing that SME managers exhibit strong tendencies toward anchoring bias, loss aversion bias, self-control bias, conservatism bias, and familiarity bias. These biases not only contribute to risk aversion

but also lead to investment inertia, preventing firms from adapting to new opportunities or reallocating resources effectively.

Moreover, our study supports the findings of Nobre et al. (2022), who demonstrated that entrepreneurs and managers tend to exhibit overconfidence, regret aversion, conservatism, and the endowment effect. These biases were also evident in our qualitative interviews, where SME managers expressed hesitation in modifying their financial strategies, a strong preference for familiar investments, and a reluctance to liquidate underperforming assets due to emotional attachment or past decisions.

By integrating these perspectives, our study reinforces the growing consensus that behavioral biases do not operate in isolation but rather interact, amplifying risk-averse behaviors and decision-making rigidity in SME financial management. Recognizing these cognitive distortions is essential for developing structured financial planning strategies that help SME managers make more rational, data-driven investment decisions.

Implications for Practice

The validated scale developed in this study offers a practical tool for organizations seeking to identify and mitigate behavioral biases in financial decision-making. Research suggests that recognizing biases and implementing corrective mechanisms can improve decision-making efficiency and financial performance (Rizzi, 2008). Training programs aimed at raising awareness of biases, as well as structured decision-making frameworks, can reduce the reliance on subjective judgments, leading to more rational investment decisions.

Furthermore, corporate financial strategies can benefit from behavioral finance principles by incorporating bias-mitigation techniques, such as scenario analysis, pre-mortem planning, and independent investment committees, which reduce the influence of individual biases on strategic decisions (Banerji, Kundu and Alam, 2023). By integrating theory with practice, this study highlights that not only individual investors but also companies—the backbone of the economy—and their decision-makers are affected by these biases.

The developed scale can be directly implemented within SMEs as a self-assessment or diagnostic tool for managers. By using the scale, business owners and financial decision-makers can gain structured insight into their cognitive and emotional tendencies that may impair objective reasoning. This enables firms to identify recurring bias patterns and develop tailored interventions, such as targeted training, decision checklists, or external advisory processes. Ultimately, this contributes to building more resilient and analytically sound financial decision-making systems within SMEs.

Limitations and Future Research Directions

While this study successfully developed and validated a behavioral bias scale for SME managers, several limitations should be acknowledged. The research was conducted within the Turkish SME sector, which may limit the generalizability of the findings to other economic and cultural contexts. Behavioral biases can be influenced by cultural norms, regulatory environments, and managerial practices, which vary across countries. Future research should aim to replicate and extend this study in diverse geographic and economic settings to test the scale's universality and cultural sensitivity.

Another limitation of this study is the absence of confirmatory factor analysis (CFA), which is essential for further validating the model. In future research, CFA will be conducted on a newly collected dataset to strengthen the scale's reliability and validity. Additionally, the study will be expanded by incorporating another variable—such as personality traits—to test the model more comprehensively. This approach will provide deeper insights into how individual characteristics influence financial decision-making biases in SME managers, enhancing the comprehensiveness and applicability of the scale.

Furthermore, the study employed a cross-sectional design and relied on self-reported data, which may introduce certain biases. Cross-sectional data does not allow for the assessment of how biases may evolve over time or in response to contextual changes. Moreover, self-reported responses may be affected by social desirability bias or limited self-awareness, potentially leading participants to underreport or misjudge their cognitive biases. Future studies could employ longitudinal designs and multi-method approaches, such as behavioral experiments or third-party assessments, to mitigate these limitations and provide more robust findings.

Conclusion

In conclusion, this study presents a robust, empirically validated scale for measuring behavioral biases in SME financial decision-making. The findings highlight the prevalence of cognitive and emotional biases and their implications for investment strategies and resource allocation. By recognizing and addressing these biases, organizations can enhance their financial decision-making processes, ultimately improving corporate performance and competitiveness in dynamic market environments.

Research Phase	Description
Preliminary Research	Conducting a detailed literature review on behavioral finance and forming an item pool. (30 items)
Qualitative Research	In-depth interviews with company executives. (7 executives) (9 items)
Qualitative Research	Gathering expert opinions on selected items and modifying/removing some items. (Total 34 items)
Quantitative Research	Conducting pre-research and pilot study to ensure content, language, and face validity. (Pre-research with 10 participants and pilot study with 35 executives)
Quantitative Research	Conducting an online survey to explore factor structure. (Exploratory Factor Analysis, 334 participants, 34 items)
Quantitative Research	Ensuring construct validity, internal consistency (reliability) by examining the relationship of items with the total and testing Cronbach's Alpha values.
Quantitative Research	Performing confirmatory factor analysis (CFA) to validate the factor structure of the scale.
Quantitative Research	Examining the relationship between behavioral biases and another variable.
Quantitative Research	Further validating the scale with a new dataset to ensure robustness and reliability.

Table 1: Overview of Research Steps in Scale Development

Interviewee	Gender	Age	Position	Education Level	Years in the Field
1	Female	47	Co-Founder Finance	Bachelor's Degree	20
2	Male	35	Manager	Bachelor's Degree	7
3	Female	38	Co-Founder	Master's Degree	12
4	Male	55	Co-Founder	Master's Degree	30
5	Male	49	Co-Founder	High School	25
6	Male	42	Co-Founder Finance	Bachelor's Degree	20
7	Male	36	Manager	Bachelor's Degree	10

Table 2: Demographic and Professional Details of Interview Participants

Process Summary	Number of Participants	Percentage (%)
Valid Responses	35	100.0
Total	35	100.0

Table 3: Summary of Pilot Study Process

Scale	Cronbach's Alpha	Standardized Cronbach's Alpha	Number of Items
Behavioral Bias Scale	0.835	0.839	34

Table 4: Cronbach's Alpha Value for Behavioral Bias Scale

Test	Value
Kaiser-Meyer-Olkin (KMO)	0.854
Bartlett's Test (Chi-Square)	9885.183
Degrees of Freedom (df)	2346
Significance (p)	0.001

Table 5: KMO and Bartlett's Test Results

Bias Type	Kolmogorov-Smirnov	Shapiro-Wilk
Anchoring Bias	0.098 (p < 0.001)	0.977 (p < 0.001)
Loss Aversion Bias	0.119 (p < 0.001)	0.968 (p < 0.001)
Self-Control Bias	0.078 (p < 0.001)	0.987 (p < 0.001)
Regret Aversion Bias	0.111 (p < 0.001)	0.977 (p < 0.001)
Endowment Bias	0.118 (p < 0.001)	0.969 (p < 0.001)
Status Quo Bias	0.110 (p < 0.001)	0.954 (p < 0.001)
Conservatism Bias	0.115 (p < 0.001)	0.978 (p < 0.001)
Familiarity Bias	0.075 (p < 0.001)	0.986 (p < 0.001)
Confirmation Bias	0.116 (p < 0.001)	0.969 (p < 0.001)

Table 6: Normality Test Results for Behavioral Biases

Bias	Skewness	Skewness Std. Error	Kurtosis	Kurtosis Std. Error
Anchoring Bias	,325	,107	,308	,213
Loss Aversion Bias	,510	,107	-0.09	,213
Self-Control Bias	-,096	,107	,006	,213
Regret Aversion Bias	,335	,107	-,153	,213
Endowment Bias	,001	,107	-,276	,213
Status Quo Bias	,044	,107	,358	,213
Conservatism Bias	,119	,107	,330	,213
Familiarity Bias	-,224	,107	,417	,213
Confirmation Bias	-,337	,107	,238	,213

Table 7: Skewness and Kurtosis Statistics for Behavioral Biases

Bias Type	KMO Value	Bartlett's Test χ^2 (df)	Significance (p)
Anchoring Bias	0.817	967.739 (6)	<0.001
Loss Aversion Bias	0.828	748.931 (6)	<0.001
Self-Control Bias	0.814	584.320 (6)	<0.001
Regret Aversion Bias	0.786	523.031 (6)	<0.001
Endowment Bias	0.727	401.047 (3)	<0.001
Status Quo Bias	0.708	668.136 (3)	<0.001
Conservatism Bias	0.834	833.096 (6)	<0.001
Familiarity Bias	0.852	946.121 (10)	<0.001
Confirmation Bias	0.539	276.282 (3)	<0.001

Table 8: KMO Value and Bartlett's Sphericity Test Results for Nine Biases

Factor	Eigenvalue	Variance Explained (%)	Cumulative Variance (%)
Anchoring Bias	2.909	72.713	72.713
Loss Aversion Bias	2.665	66.618	66.618
Self-Control Bias	2.397	59.927	59.927
Regret Aversion Bias	2.262	56.543	56.543
Endowment Bias	1.914	63.791	63.791
Status Quo Bias	2.275	75.825	75.825
Conservatism Bias	2.769	69.236	69.236
Familiarity Bias	3.088	61.762	61.762
Confirmation Bias	1.404	70.178	70.178

Table 9: Eigenvalues and Total Explained Variance of the Correlation Matrix for Behavioral Biases

Bias Type	Statement No	Statement	Factor Loadings
Anchoring Bias	Q3	When making an investment, the first price offer I receive often forms the basis of my buying and selling decisions.	0,901
Anchoring Bias	Q2	When evaluating a new investment opportunity, I use the current price levels in the industry as a starting point.	0,873
Anchoring Bias	Q1	When selling an investment, I consider the initial price I paid as an important factor.	0,863
Anchoring Bias	Q4	When making an investment, I usually prioritize the first piece of information I acquire in my decision-making process.	0,769
Loss Aversion Bias	Q1	The feelings I experience from a financial loss are stronger than those from a financial gain.	0, 862
Loss Aversion Bias	Q2	I give more importance to the potential risk of loss in an investment than to the potential gain of the same amount.	0, 852
Loss Aversion Bias	Q3	When investing, I focus on the worst-case scenario and prefer safe options, even if the probability of that scenario is low.	0, 817
Loss Aversion Bias	Q4	When taking financial risks, I prefer less profitable but safer options to minimize potential losses.	0, 726
Self-Control Bias	Q3	Even when I know it is unnecessary, I find myself making impulsive purchases.	0,860
Self-Control Bias	Q1	I may buy things I want, even if they are not the best financial choices.	0,810
Self-Control Bias	Q2	I may postpone the necessary savings and investment decisions required to achieve my long-term financial goals.	0,754
Self-Control Bias	Q4	I may give up on my long-term goals for short-term gains.	0,657
Regret Aversion Bias	Q2	When investing, I fear regretting the possible negative outcomes of the investment.	0,817
Regret Aversion Bias	Q4	After a failed investment, I act carefully to avoid similar investments and may even overlook good opportunities.	0,759

Regret Aversion Bias	Q1	My past poor financial decisions have led me to change my current investment decisions.	0,732
Regret Aversion Bias	Q3	Negative investment experiences in the past have made me more cautious about new opportunities.	0,694
Endowment Bias	Q3	I am optimistic that my investments will perform well in the future.	0,821
Endowment Bias	Q1	Because I attribute special value to some of my investments, I hesitate to change or sell them regardless of market conditions.	0,794
Endowment Bias	Q2	I do not feel the same level of confidence in new or different investment opportunities as I do in my current investments.	0,780
Status Quo Bias	Q3	As long as I am satisfied with the current situation, I do not put much effort into researching the potential advantages of alternative options.	0,971
Status Quo Bias	Q2	When I have to make a decision, I accept the default option without questioning it.	0,855
Status Quo Bias	Q1	I prefer to maintain my current position when presented with new options due to the uncertainties that change may bring.	,776
Conservatism Bias	Q2	When I receive new information, I usually hesitate to make significant changes in my existing investment strategy.	0,971
Conservatism Bias	Q3	When I learn new negative information about an investment, I find it difficult to reconcile it with my previous positive beliefs.	0,855
Conservatism Bias	Q1	Once I invest, I do not easily change my views.	,776
Conservatism Bias	Q4	When there are unexpected changes in financial markets, I interpret them based on my initial beliefs and seek further evidence before taking action.	0,971
Familiarity Bias	Q2	When a company's products or services align with my personal interests, I am more likely to invest in it regardless of its financial performance.	0,971
Familiarity Bias	Q3	When investing in companies that reflect my personal values, I focus less on data regarding their long-term financial sustainability or profitability.	0,855
Familiarity Bias	Q1	I invest in companies where my family and close circle also invest.	,776
Familiarity Bias	Q4	I invest in companies that produce products I like.	0,971
Familiarity Bias	Q2	I prefer investing in domestic companies rather than foreign companies.	0,971
Confirmation Bias	Q3	When an investment decision does not go well, I tend to seek information that confirms that I made the right choice.	.738
Confirmation Bias	Q4	When investing, I usually prefer to follow analyst reports and news that align with my own views.	.652
Confirmation Bias	Q1	When I encounter a negative opinion about an investment I have made, I generally consider that opinion incorrect or irrelevant.	.345

Table 10: Factor Structure Resulting from Exploratory Factor Analysis

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Appendix: Final Scale ¹

Statement No	Statement	Bias Type
1	When selling an investment, I consider the initial price I paid as an important factor.	Anchoring (1-4)
2	When evaluating a new investment opportunity, I use the current price levels in the industry as a starting point.	Anchoring (1-4)
3	When making an investment, the first price offer I receive often forms the basis of my buying and selling decisions.	Anchoring (1-4)
4	When making an investment, I usually prioritize the first piece of information I acquire in my decision-making process.	Anchoring (1-4)
5	The feelings I experience from a financial loss are stronger than those from a financial gain.	Loss Aversion (5-8)
6	I give more importance to the potential risk of loss in an investment than to the potential gain of the same amount.	Loss Aversion (5-8)
7	When investing, I focus on the worst-case scenario and prefer safe options, even if the probability of that scenario is low.	Loss Aversion (5-8)
8	When taking financial risks, I prefer less profitable but safer options to minimize potential losses.	Loss Aversion (5-8)
9	I may buy things I want, even if they are not the best financial choices.	Self-Control (9-12)
10	I may postpone the necessary savings and investment decisions required to achieve my long-term financial goals.	Self-Control (9-12)
11	Even when I know it is unnecessary, I find myself making impulsive purchases.	Self-Control (9-12)
12	I may give up on my long-term goals for short-term gains.	Self-Control (9-12)
13	My past poor financial decisions have led me to change my current investment decisions.	Regret Aversion (13-16)
14	When investing, I fear regretting the possible negative outcomes of the investment.	Regret Aversion (13-16)
15	Negative investment experiences in the past have made me more cautious about new opportunities.	Regret Aversion (13-16)
16	After a failed investment, I act carefully to avoid similar investments and may even overlook good opportunities.	Regret Aversion (13-16)
17	Because I attribute special value to some of my investments, I hesitate to change or sell them regardless of market conditions.	Endowment Effect (17-19)
18	I do not feel the same level of confidence in new or different investment opportunities as I do in my current investments.	Endowment Effect (17-19)
19	I am optimistic that my investments will perform well in the future.	Endowment Effect (17-19)

¹ If requested, the actual screenshots of the analyses and statistical outputs can be provided to ensure transparency and reproducibility of the findings. Please let us know if further documentation or supplementary materials are required.

20	I prefer to maintain my current position when presented with new options due to the uncertainties that change may bring.	Status Quo (20-22)
21	When I have to make a decision, I accept the default option without questioning it.	Status Quo (20-22)
22	As long as I am satisfied with the current situation, I do not put much effort into researching the potential advantages of alternative options.	Status Quo (20-22)
23	Once I invest, I do not easily change my views.	Conservatism (23-26)
24	When I receive new information, I usually hesitate to make significant changes in my existing investment strategy.	Conservatism (23-26)
25	When I learn new negative information about an investment, I find it difficult to reconcile it with my previous positive beliefs.	Conservatism (23-26)
26	When there are unexpected changes in financial markets, I interpret them based on my initial beliefs and seek further evidence before taking action.	Conservatism (23-26)
27	I invest in companies that produce products I like.	Familiarity (27-31)
28	When a company's products or services align with my personal interests, I am more likely to invest in it regardless of its financial performance.	Familiarity (27-31)
29	When investing in companies that reflect my personal values, I focus less on data regarding their long-term financial sustainability or profitability.	Familiarity (27-31)
30	I invest in companies where my family and close circle also invest.	Familiarity (27-31)
31	I prefer investing in domestic companies rather than foreign companies.	Familiarity (27-31)
32	When an investment decision does not go well, I tend to seek information that confirms that I made the right choice.	Confirmation (32-34)
33	When investing, I usually prefer to follow analyst reports and news that align with my own views.	Confirmation (32-34)
34	When I encounter a negative opinion about an investment I have made, I generally consider that opinion incorrect or irrelevant.	Confirmation (32-34)