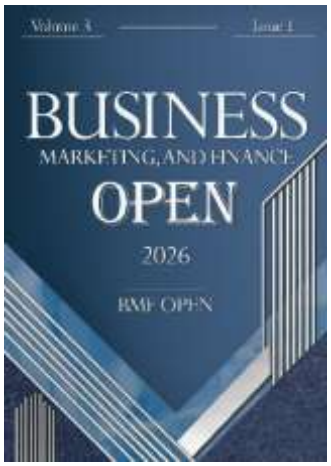
Presenting a Model of Managers' Asymmetric Behavioral Biases in Investors' Affective and Emotional Decision-Making and Corporate Financial Development

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Abstract: Classical financial theories assume that investors behave entirely rationally; however, in practice, their decisions are influenced by emotions, psychological biases, and cognitive errors. Biases such as loss aversion (the tendency to avoid losses more strongly than to pursue equivalent gains) and herding behavior may lead investors to buy at market peaks or sell at market troughs. Awareness of these biases can clearly help investors avoid herd-like behavior. Furthermore, understanding the influence of emotions on decision-making facilitates the development of rule-based strategies, such as diversification and portfolio rebalancing. The present study aimed to develop a model of managers' asymmetric behavioral biases in investors' affective and emotional decision-making and corporate financial development. The study adopted an exploratory research approach. The study population consisted of experts relevant to the research topic who had professional experience in management and capital markets. In this regard, characteristics such as in-depth knowledge of macroeconomics and financial markets, proficiency in fundamental analysis, competence in calculating and interpreting key financial ratios, proficiency in technical analysis, expertise in portfolio and risk management, and familiarity with capital-market laws and regulations were considered the criteria for expert selection. Accordingly, the final number of experts was 24. Subsequently, 17 main categories were identified through semi-structured interviews with these experts. The findings of the study resulted in the identification of dimensions and components influencing investors' affective and emotional decisions and corporate financial development. These dimensions and components were derived from a review of theoretical studies, synthesis of the opinions of accounting and auditing experts, analysis of the views of the study population, and consultation with specialists in fields related to the research.

Keywords: investor decision-making, financial development.

1. Introduction

Financial decision-making has traditionally been explained through models that assume rationality, consistent preferences, efficient information processing, and utility-maximizing behavior. Under this conventional perspective, investors and managers are expected to evaluate available information objectively, assess risk and return systematically, and select alternatives that maximize economic value. Nevertheless, the persistent occurrence of speculative bubbles, market crashes, excessive volatility, anomalous trading patterns, and inconsistent corporate decisions has challenged the assumption that financial actors behave in a fully rational manner. Behavioral finance emerged partly in response to this limitation by integrating psychological, cognitive, and emotional explanations into the analysis of financial behavior. Rather than treating deviations from rationality as random errors, behavioral finance

considers them systematic and potentially predictable outcomes of bounded cognition, heuristics, affective responses, and social influence [1-3].

A central proposition of behavioral finance is that investment decisions are influenced not only by objective financial indicators but also by cognitive biases and emotional states. Investors frequently process information through mental shortcuts that simplify complex decisions but may also distort risk perception, probability assessment, and valuation. Confirmation bias can cause decision-makers to selectively seek or interpret information that supports their prior beliefs, whereas anchoring bias can lead them to rely excessively on an initial reference point even after new information becomes available. Availability bias may result in overweighing recent, vivid, or easily recalled information, while self-serving bias can encourage individuals to attribute successful outcomes to their own abilities and unfavorable outcomes to external circumstances. Overconfidence may further intensify excessive trading, overly optimistic forecasting, and underestimation of uncertainty. These biases are not isolated phenomena; rather, they often coexist and interact, influencing the entire sequence of investment evaluation and choice [4-6].

The importance of behavioral biases becomes particularly evident in contexts characterized by uncertainty, ambiguity, incomplete information, and rapidly changing market conditions. Under such circumstances, investors may shift from analytical reasoning toward emotionally driven responses. Fear can induce premature selling, excessive liquidity preference, or avoidance of otherwise viable investments, whereas greed may encourage speculative risk-taking and excessive exposure to rapidly appreciating assets. Regret may influence both action and inaction by encouraging investors either to avoid realizing losses or to enter positions out of fear of missing profitable opportunities. Loss aversion is especially important because investors commonly perceive the psychological impact of losses as greater than the satisfaction derived from equivalent gains. Accordingly, emotional reactions can produce asymmetric responses to positive and negative information, contributing to nonlinear patterns of market behavior and financial decision-making [7-9].

Such behavioral responses are also closely related to herding behavior, in which investors imitate the decisions of others rather than relying primarily on independent assessment. Herding can arise because individuals infer information from the actions of other market participants, seek psychological reassurance from conformity, or attempt to reduce the perceived reputational cost of making an unconventional decision. During periods of severe market stress, these tendencies may become stronger because uncertainty increases and independent valuation becomes more difficult. Evidence from the COVID-19 period has shown that investor behavior and policy responses can become intertwined with herding dynamics, while studies of cryptocurrency markets have demonstrated links between delayed price adjustment and herd-like trading behavior [10, 11]. Similar patterns may also emerge during geopolitical shocks, when sudden changes in risk perception reshape investor attitudes toward financial markets [9].

The behavioral perspective is also relevant to differences between retail and institutional investors. Retail investors may be especially vulnerable to emotion, limited financial literacy, social influence, and cognitive simplification, whereas institutional investors typically possess greater analytical resources, access to information, and professional expertise. However, institutional status does not eliminate behavioral distortions. Institutional investors can also respond to performance pressure, benchmark effects, fund flows, reputational concerns, and organizational incentives. Research on mutual fund flows suggests that behavioral biases may shape the relationship between investor flows and performance, indicating that market participation and capital movement cannot be understood solely through conventional rational-choice models [12]. More broadly, systematic reviews

of participation in initial public offerings have highlighted differences between retail and institutional perspectives, reinforcing the importance of examining behavioral heterogeneity across investor categories [13, 14].

Individual characteristics may further affect the susceptibility of investors to behavioral biases. Financial literacy can shape the ability to interpret market information, understand diversification, evaluate financial products, and recognize decision errors. Personality characteristics may also influence risk tolerance, confidence, emotional regulation, and investment style. Research examining the Big Five personality traits has demonstrated that investment biases may be meaningfully related to individual psychological characteristics and that financial literacy can play an important moderating role [15]. These findings support the view that behavioral finance should not treat all investors as behaviorally homogeneous. Instead, bias formation and expression are likely to depend on a combination of personal attributes, financial knowledge, market experience, and situational pressures.

At the same time, behavioral biases are not confined to external investors. Managers themselves may display self-interested behavior, cognitive distortions, and emotionally influenced strategic judgment. Managerial decisions concerning financing, investment, disclosure, capital structure, liquidity, and corporate strategy are frequently made under conditions of incomplete information and uncertainty. Managerial self-interest may affect strategic decision-making, particularly when personal incentives are not fully aligned with organizational objectives [16]. Behavioral biases can therefore enter corporate finance through both sides of the decision process: investors may misinterpret firm information, while managers may generate or communicate information in a biased or strategically manipulated manner.

This interaction becomes particularly important in the area of corporate disclosure. Information disclosed by management can shape investor expectations, sentiment, valuation, and trading behavior. However, the tone, framing, timing, and completeness of disclosure may itself be influenced by managerial incentives. Recent evidence indicates that corporate digital transformation may affect management's manipulation of disclosure tone, suggesting that technological development does not automatically eliminate strategic communication behavior [17]. If investors are simultaneously subject to confirmation bias, anchoring, overconfidence, or emotional reactions, managerial communication may amplify rather than reduce behavioral distortions. Consequently, the relationship between managerial behavior and investor psychology represents an important mechanism through which asymmetry can arise in financial decision-making.

Information asymmetry provides another major link between behavioral finance and corporate financial development. When market participants possess unequal access to relevant information, uncertainty increases and investors may rely more heavily on heuristics, reputation signals, market sentiment, and observable behavior of other participants. Asymmetric information can also affect the cost of capital, stock returns, earnings management incentives, and market efficiency. Studies have shown that asymmetric information is associated with earnings management and the cost of equity, emphasizing its relevance for corporate financing conditions [18]. Similarly, ESG disclosure, accrual quality, and information asymmetry have been linked to future stock returns, indicating that the quality and credibility of corporate information may influence both valuation and investor behavior [19].

The relationship between information asymmetry and sustainability-related financial behavior has also gained increasing attention. Sustainable equity indices may exhibit patterns of connectedness and information asymmetry, especially in emerging markets where market depth, institutional quality, and disclosure standards can vary substantially [20]. Green financial development may also affect stock price crash risk through mechanisms associated with information asymmetry, suggesting that improvements in financial development and transparency can influence the probability of extreme negative market outcomes [21]. These findings are particularly relevant to

behavioral finance because insufficient or unevenly distributed information can intensify emotional responses, speculative interpretation, and biased decision-making.

Environmental, social, and governance considerations have increasingly become part of corporate financial strategy and investor evaluation. ESG disclosure can serve not only as a sustainability signal but also as a mechanism for reducing uncertainty and strengthening transparency. Where such disclosure is credible and consistent, it may help reduce information asymmetry and support more disciplined investment assessment. Conversely, weak or selective disclosure may create room for biased interpretation or opportunistic managerial communication. The growing role of ESG therefore connects corporate governance, investor psychology, financial transparency, and market valuation within a common analytical framework [19, 20].

Corporate governance is equally important because it can constrain managerial opportunism and improve the reliability of financial and nonfinancial information. Strong governance mechanisms can enhance accountability, improve monitoring, and reduce the extent to which personal incentives distort corporate decisions. From a behavioral perspective, governance structures may also function as institutional safeguards against overconfidence, self-interest, excessive optimism, and emotionally driven managerial choices. This is especially important when strategic decisions involve high uncertainty, such as major financing transactions, equity issuance, restructuring, and capital allocation. Research on seasoned equity offerings has demonstrated that organizational complexity can affect financing behavior, indicating that corporate structure itself may interact with managerial decision processes [22].

Financial development also depends heavily on the quality of firms' capital structure, liquidity management, financing access, and risk-management decisions. These mechanisms determine whether firms can obtain capital efficiently, withstand shocks, and allocate financial resources productively. From a behavioral perspective, however, such decisions may be influenced by biased expectations regarding risk, market conditions, or future performance. Managers who are overconfident may underestimate financing risk, while investors who are loss averse or fearful may demand higher returns or withdraw capital during periods of uncertainty. In illiquid markets, these effects can become more severe because transaction frictions amplify the consequences of sudden shifts in sentiment. Evidence from international financial markets during the COVID-19 period demonstrates the relevance of illiquidity risk under stressed market conditions [23].

The risk–return relationship itself is also more complex than a simple linear trade-off. Investors may perceive identical levels of objective risk differently depending on prior outcomes, emotional states, reference points, or framing. Nonparametric and flexible approaches to risk and return have been proposed partly because conventional models may not fully capture heterogeneous return exposure and market uncertainty [24]. Behavioral biases add another layer of complexity by influencing how probabilities and outcomes are subjectively interpreted. Thus, risk management in a behavioral-finance framework should account not only for measurable market volatility but also for the way decision-makers perceive and respond to risk.

The asymmetric nature of financial responses has become particularly evident during market crises. The COVID-19 pandemic revealed that negative and positive shocks may not have symmetric effects on stock-market behavior, liquidity, volatility, and investor sentiment. Evidence from the Moroccan stock exchange, for example, has shown asymmetric market effects associated with the pandemic [25]. Such findings are highly relevant to the study of behavioral biases because psychological responses to losses and threats are generally stronger than responses to equivalent gains. In other words, investors and managers may react disproportionately to adverse information, and these asymmetric reactions may propagate through prices, financing conditions, and corporate decisions.

Behavioral biases can also affect strategic decision-making inside firms. Empirical research has found meaningful relationships between behavioral biases and strategic choices in emerging-market settings, demonstrating that such biases are not limited to short-term trading behavior but may influence broader organizational decisions [26]. This is particularly important because managerial decisions concerning investment, financing, risk, and resource allocation ultimately influence corporate financial development. If cognitive and emotional biases systematically affect these decisions, they may alter financing costs, capital productivity, resilience, and long-term value creation.

The connection between behavioral finance and corporate performance therefore extends beyond the study of investor sentiment. Behavioral finance provides a framework for understanding how psychological tendencies can influence organizational outcomes, financial performance, governance, and corporate strategy [3]. In this respect, behavioral biases should be examined not as isolated individual errors but as part of a broader system linking managerial cognition, investor emotion, financial information, governance mechanisms, and market structures. This systems perspective is particularly appropriate when different biases reinforce one another and when managerial and investor decisions interact recursively.

Recent research has increasingly emphasized the interrelationships among behavioral biases rather than examining each bias independently. Integrated analytical approaches show that biases can influence one another through complex causal networks [6]. For example, overconfidence may strengthen confirmation bias by encouraging investors to place greater trust in their own prior judgments; anchoring may interact with loss aversion by reinforcing attachment to purchase prices; and availability bias may intensify fear after highly salient negative events. Such interactions suggest that a comprehensive behavioral model should identify not only the presence of individual biases but also their structural relationships and their combined effects on financial outcomes.

Investor sentiment further provides an important mechanism through which psychological forces are translated into observable market behavior. Structural modeling of investor sentiment has demonstrated that attitudinal and psychological factors can significantly influence market participation and decision-making [8]. Accordingly, affective and emotional responses should be incorporated alongside cognitive biases when explaining investment decisions. A model that focuses exclusively on cognitive heuristics without considering fear, greed, regret, and loss aversion may overlook some of the strongest drivers of market behavior during periods of uncertainty.

Despite substantial advances in behavioral finance, an important research gap remains. Much of the existing literature focuses either on specific investor biases, individual investment decisions, market anomalies, institutional behavior, or managerial decision-making in isolation. Fewer studies integrate managerial behavioral biases, investor affective and emotional decisions, intervening corporate-finance mechanisms, contextual emotional factors, and financial-development outcomes within a single explanatory framework. This gap is especially important because the effects of behavioral biases are likely to be transmitted through mechanisms such as corporate governance, financial strategy, risk management, capital structure optimization, access to financial resources, liquidity management, and capital allocation rather than operating directly and independently.

A comprehensive model can therefore contribute by clarifying how causal behavioral factors, emotional and contextual factors, intervening managerial and financial mechanisms, strategic responses, and ultimate financial consequences are interconnected. Such an approach can also provide practical value by identifying strategies for increasing awareness of behavioral biases, strengthening emotional self-regulation, improving financial planning, reducing irrational herding, promoting transparent ESG practices, strengthening corporate governance, and improving the quality of investment and financing decisions. By integrating behavioral and corporate-finance

perspectives, such a model may offer a more realistic explanation of how managerial and investor behavior affects financial development under conditions of uncertainty, asymmetric information, and market stress.

Accordingly, the aim of the present study is to develop a model of managers' asymmetric behavioral biases in investors' affective and emotional decision-making and corporate financial development.

2. Methods and Materials

The present study adopted an exploratory approach. Given that the primary objective of the study was exploratory and fundamental and focused on developing an appropriate framework, a mixed-methods research strategy was considered suitable for investigating the research problem. Within this framework, qualitative methods such as grounded theory were employed. Overall, considering the objectives, subject matter, and research approach, the study followed a sequential qualitative–quantitative mixed-methods design, in which qualitative data were first collected and analyzed, followed by quantitative data collection and analysis. Priority was generally assigned to the qualitative phase, while quantitative data were used to reinforce the qualitative findings.

The primary research instruments were the tools used by the researcher to record and organize the data:

- **Audio recorder:** An essential instrument for accurately recording interviews.
- **Video or photographic camera:** Used to record field observations, subject to obtaining participants' consent.
- **Notebook and pen:** Used to record field notes, preliminary ideas, and interpretations during observations or immediately afterward.
- **Interview guide:** A list of general questions or topics to be addressed during the interviews.
- **Informed consent form:** Used to comply with ethical principles and obtain participants' consent.

The instruments and sources used for collecting information and data included:

- Review of theoretical foundations, models, documents, records, and other materials related to the research topic.
- Academic documents and records.
- Scientific and research journals and publications.
- Electronic resources and Internet websites.

Open coding is the first stage of qualitative data analysis, particularly within the grounded theory approach. At this stage, the researcher carefully examines raw data, including interviews and notes, and extracts preliminary concepts and themes in the form of descriptive codes. This stage is conducted with the aim of discovering new concepts without imposing predetermined theoretical assumptions and provides the foundation for subsequent coding stages, namely axial and selective coding.

Axial coding in qualitative research is the stage during which the researcher organizes and establishes relationships among the categories generated during open coding. In this process, the researcher focuses on a central or "axial category," relates other concepts and categories to it, and develops an overarching paradigm or framework. The primary objective is to identify systematic relationships among categories and extract meaningful patterns for the development of a grounded theory.

Selective coding is the third and final stage of grounded theory development, during which the researcher selects a central "core category" and links the remaining categories and concepts to this principal category in order to develop a coherent and comprehensive theory. This stage involves integrating the findings obtained from the

previous stages of open and axial coding, refining the categories, and ultimately validating the theory by comparing it with the raw data.

The study population consisted of experts relevant to the research topic who were professionally engaged in management and capital markets. The experts selected for the study were required to meet the following criteria:

- In-depth knowledge of macroeconomics and financial markets.
- Proficiency in fundamental analysis.
- Competence in calculating and interpreting key financial ratios, such as P/E, P/S, P/B, D/E, ROE, and ROA.
- Proficiency in technical analysis.
- Expertise in portfolio and risk management.
- Familiarity with capital-market laws and regulations.

Subsequently, sampling in this study was initiated in accordance with qualitative research procedures through purposive sampling and continued using theoretical sampling. Initially, individuals who possessed substantial information concerning management and investment concepts related to the present research topic and who could contribute meaningfully to understanding the research problem and the central phenomenon were purposively selected. Sampling then continued until theoretical saturation was achieved; that is, until the inclusion of an additional participant no longer contributed new information to the emerging categories or developing theory. In the present study, theoretical saturation was largely evident after interviewing 18 participants. Nevertheless, to increase confidence and address potential conceptual gaps in the developed model, six additional experts were interviewed. Consequently, the final number of experts selected through purposive sampling reached 24.

3. Findings and Results

The descriptive statistics are presented in Table 1. The information is categorized according to gender, place of residence, educational attainment, and age.

In descriptive statistics, information is summarized and presented through tables and figures, without drawing inferential conclusions or generalizing the findings to the broader population.

In other words, statistical information is summarized using tables and charts to provide an overall and comprehensive representation of the subject under investigation.

Table 1. Frequency Distribution of Demographic Variables

Gender	Frequency	Percentage	Place of Residence	Frequency	Percentage
Male	13	54%	Tehran	18	75%
Female	11	46%	Other provinces	6	25%
Total	24	100%	Total	24	100%
Educational Attainment	Frequency	Percentage	Age	Frequency	Percentage
Master's degree	6	25%	Under 40 years	3	13%
			40–50 years	9	38%
Doctoral degree	18	75%	Over 50 years	12	49%
Total	24	100%	Total	24	100%

According to the Delphi technique, each group member was initially provided with a questionnaire containing the relevant subcriteria. Subsequently, the individual indicators were evaluated in accordance with the Delphi method by the 24 selected experts, all of whom were familiar with the relevant issues. For the initial screening of the identified indicators, scores ranging from 1 to 10 were assigned, and indicators receiving scores below 7 were

eliminated. The Delphi technique was conducted over three rounds and terminated in the third round after final consensus was achieved.

The first round of expert-opinion assessment was conducted as follows. To aggregate the data obtained from the first round of the fuzzy Delphi process, Am, representing the mean opinion of the experts, was calculated.

$Am = (am1^i, am2^i, am3^i) = ((1/n)\Sigma a1^[i], (1/n)\Sigma a2^[i], (1/n)\Sigma a3^[i])$

In the above equation, Am represents the mean opinions of the experts. The next step is defuzzification, which refers to the process of converting a fuzzy set into non-fuzzy values. In the present study, the mean-value method was employed. The defuzzified value based on the mean-value method is calculated as follows:

$S(A) = 1/2(SL(A) + SR(A)) = 1/2[(a2i - \int a1i^a2i\ f\bar{A}(x)) + (a2i - \int a2i^a3i\ f\bar{A}(x))] = (a1i + a2i + a3i)/3$

Table 2. Mean Expert Opinions and Defuzzification in the First Round

Subcriterion	a3	a2	a1	Defuzzified Value
Confirmation bias	8.909	7.909	7.909	8.242
Anchoring bias	8.364	7.364	7.364	7.697
Availability bias	8.727	7.727	7.727	8.060
Self-serving bias	7.182	7.182	7.182	7.182
Overconfidence bias	8.636	7.636	7.636	7.969
Fear	8.636	7.636	7.636	7.969
Greed	7.091	7.727	7.727	7.515
Regret	8.727	7.727	7.727	8.060
Endowment effect	8.455	7.455	7.455	7.788
Loss aversion	8.512	7.451	7.351	7.771
Financial strategy formulation	8.021	7.542	7.645	7.736
Corporate governance	8.141	7.114	7.582	7.612
Risk management	8.231	7.625	7.110	7.655
Capital structure optimization	8.582	8.032	7.252	7.955
Access to financial resources	8.659	8.551	7.322	8.177
Liquidity management	7.658	8.978	7.988	8.208
Optimal capital allocation	8.001	7.285	7.025	7.437

The second round of expert-opinion assessment was conducted as follows. The mean expert opinions and defuzzification results for the second round are presented in Table 3.

Table 3. Mean Expert Opinions and Defuzzification in the Second Round

Subcriterion	a3	a2	a1	Defuzzified Value
Confirmation bias	9.182	8.182	7.182	8.182
Anchoring bias	8.909	7.909	6.909	7.909
Availability bias	8.909	7.909	6.909	7.909
Self-serving bias	8.818	7.818	6.818	7.818
Overconfidence bias	9.000	8.000	7.000	8.000
Fear	9.182	8.182	7.182	8.182
Greed	8.909	7.909	6.909	7.909
Regret	8.121	7.541	6.621	7.428
Endowment effect	7.582	7.251	6.321	7.051
Loss aversion	7.541	7.641	6.002	7.061
Financial strategy formulation	7.182	7.182	7.182	7.182
Corporate governance	8.636	7.636	7.636	7.969
Risk management	8.636	7.636	7.636	7.969
Capital structure optimization	7.091	7.727	7.727	7.515
Access to financial resources	8.727	7.727	7.727	8.060

Liquidity management	8.455	7.455	7.455	7.788
Optimal capital allocation	8.512	7.451	7.351	7.771

The difference between the mean values obtained in Rounds 1 and 2 was calculated using the distance between fuzzy numbers, as follows:

$S(Am2, Am1) = [1/3[(am21 + am22 + am23) - (am11 + am12 + am13)]]$

Based on the above equation, the differences between the first and second rounds are presented in Table 4. Expert consensus was calculated accordingly, and if the calculated difference was less than 0.02, the fuzzy Delphi process was terminated.

Table 4. Differences in Expert Opinions Between the First and Second Delphi Rounds

Subcriterion	First Round	Second Round	Absolute Difference Between Rounds 1 and 2
Confirmation bias	8.242	8.182	0.060
Anchoring bias	7.697	7.909	0.212
Availability bias	8.060	7.909	0.151
Self-serving bias	7.182	7.818	0.636
Overconfidence bias	7.969	8.000	0.031
Fear	7.969	8.182	0.213
Greed	7.515	7.909	0.394
Regret	8.060	7.428	0.633
Endowment effect	7.788	7.051	0.737
Loss aversion	7.771	7.061	0.710
Financial strategy formulation	7.736	7.182	0.554
Corporate governance	7.612	7.969	0.357
Risk management	7.655	7.969	0.314
Capital structure optimization	7.955	7.515	0.440
Access to financial resources	8.177	8.060	0.117
Liquidity management	8.208	7.788	0.420
Optimal capital allocation	7.437	7.771	0.334

In the third round of expert-opinion assessment, the necessary modifications were made to the model indicators. A third questionnaire was then prepared and redistributed to the expert group, together with each expert's previous opinion and information concerning the extent to which that opinion differed from those of the other experts.

The mean expert opinions and defuzzification results for the third round are presented in Table 5.

Table 5. Mean Expert Opinions and Defuzzification in the Third Round

Subcriterion	a3	a2	a1	Defuzzified Value
Confirmation bias	9.273	8.273	7.273	8.273
Anchoring bias	9.000	8.000	7.000	8.000
Availability bias	9.000	8.000	7.000	8.000
Self-serving bias	8.909	7.909	6.909	7.909
Overconfidence bias	9.091	8.091	7.091	8.091
Fear	9.182	8.182	7.182	8.182
Greed	9.000	8.000	7.000	8.000
Regret	8.235	7.541	7.215	7.664
Endowment effect	8.632	7.251	7.632	7.838
Loss aversion	9.000	8.000	7.000	8.000
Financial strategy formulation	7.541	7.641	6.002	7.061

Corporate governance	7.182	7.182	7.182	7.182
Risk management	8.636	7.636	7.636	7.969
Capital structure optimization	8.636	7.636	7.636	7.969
Access to financial resources	7.091	7.727	7.727	7.515
Liquidity management	8.727	7.727	7.727	8.060
Optimal capital allocation	8.455	7.455	7.455	7.788

The differences between the second and third rounds are presented in Table 6.

Table 6. Differences in Expert Opinions Between the Second and Third Delphi Rounds

Subcriterion	Second Round	Third Round	Absolute Difference Between Rounds 2 and 3
Confirmation bias	8.182	8.273	0.091
Anchoring bias	7.909	8.000	0.091
Availability bias	7.428	8.000	0.572
Self-serving bias	7.051	7.909	0.858
Overconfidence bias	7.061	8.091	1.030
Fear	7.182	8.182	1.000
Greed	7.969	8.000	0.039
Regret	7.969	7.664	0.305
Endowment effect	7.515	7.838	0.323
Loss aversion	8.160	8.000	0.160
Financial strategy formulation	7.788	7.061	0.188
Corporate governance	7.771	7.182	0.589
Risk management	7.736	7.969	0.233
Capital structure optimization	7.612	7.969	0.357
Access to financial resources	7.655	7.515	0.140
Liquidity management	7.955	8.060	0.105
Optimal capital allocation	8.048	7.788	0.260

According to Table 6 and the calculated differences between the mean values obtained in Rounds 2 and 3, the experts reached consensus regarding the relevant indicators.

In the supplementary stage of the study, the research literature and the results of the qualitative data analysis were used to develop the proposed model. At this stage, the required statistical tests were employed to determine the degree of model fit. The results of the statistical tests indicated that the difference between the mean value of the proposed model across all dimensions and the expected mean was statistically significant at an error level below 5%. Therefore, at the 95% confidence level, the statistical model was approved by the experts.

The proposed model of managers' asymmetric behavioral biases in investors' affective and emotional decision-making and corporate financial development is presented below.

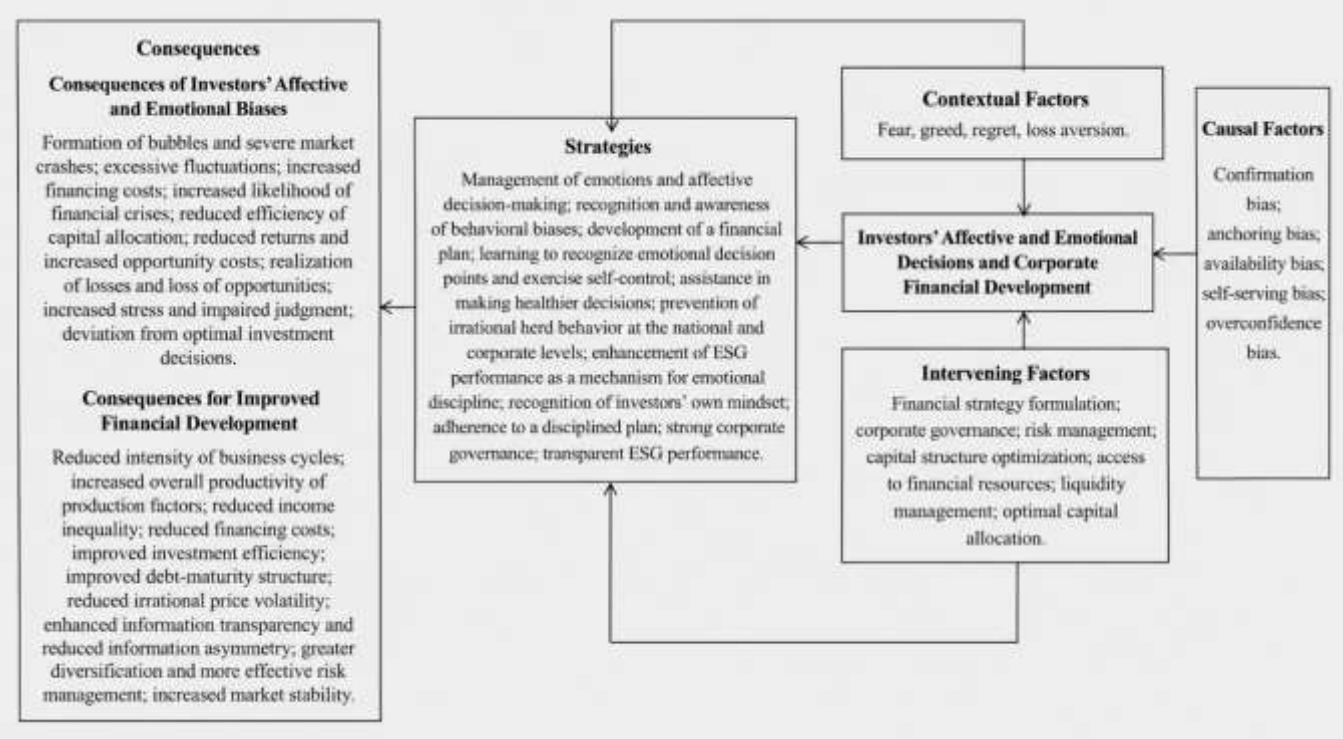


Figure 1. Model of Managers' Asymmetric Behavioral Biases in Investors' Affective and Emotional Decision-Making and Corporate Financial Development

The findings of this study resulted in the identification of the dimensions and components influencing investors' affective and emotional decision-making and corporate financial development. These dimensions and components were identified through theoretical studies, synthesis of the opinions of experts in accounting and auditing, analysis of the views of the study population, and consultation with specialists in fields related to the research.

4. Discussion and Conclusion

The present study developed a model of managers' asymmetric behavioral biases in investors' affective and emotional decision-making and corporate financial development. The qualitative and fuzzy Delphi findings indicated that the proposed framework is composed of five interconnected domains: causal factors, contextual factors, intervening factors, strategies, and consequences. The causal factors consisted of confirmation bias, anchoring bias, availability bias, self-serving bias, and overconfidence bias. The contextual factors included fear, greed, regret, and loss aversion. The intervening factors comprised financial strategy formulation, corporate governance, risk management, capital structure optimization, access to financial resources, liquidity management, and optimal capital allocation. The strategic responses emphasized emotional regulation, awareness of behavioral biases, financial planning, self-control, reduction of irrational herding, improvement of ESG performance, disciplined decision-making, strong corporate governance, and transparent ESG practices. Finally, the consequences were divided into adverse outcomes associated with affective and emotional biases and positive outcomes associated with improved financial development. These results support the central proposition of behavioral finance that financial decisions are not produced solely by rational calculations of risk and return but are also shaped by cognitive heuristics, emotions, organizational structures, and information conditions [1, 2, 4].

One of the most important findings of the study was the identification of confirmation bias, anchoring bias, availability bias, self-serving bias, and overconfidence as the principal causal behavioral factors. This finding is

consistent with prior behavioral-finance research showing that investment decisions are systematically influenced by cognitive shortcuts and distorted judgment rather than by fully rational information processing. Rasheed and Rehman showed that behavioral biases are significantly related to investment decisions in the Pakistan Stock Exchange, while Safaie et al. demonstrated that investors' biases are structurally interrelated rather than independent [5, 6]. The present model extends these findings by positioning these biases as antecedent conditions that can influence both investor reactions and managerial financial decision-making. In particular, confirmation bias may cause decision-makers to emphasize evidence supporting existing expectations, anchoring can result in excessive reliance on initial values or forecasts, and availability bias can give disproportionate weight to recent or salient events. Overconfidence may further reinforce these distortions by creating unwarranted certainty regarding forecasts, valuation, or strategic choices. This interpretation is also compatible with the broader argument that behavioral finance helps explain departures from rational expectations in both market and corporate settings [3].

The inclusion of self-serving bias among the causal factors is particularly relevant to the managerial dimension of the proposed model. Managers may interpret favorable outcomes as evidence of their own competence while attributing negative results to external forces, thereby weakening organizational learning and increasing the likelihood of repeated errors. Cai's analysis of managerial self-interest similarly indicates that self-interested behavior can meaningfully affect strategic decision-making and organizational outcomes [16]. The finding therefore suggests that asymmetric behavioral biases should not be conceptualized exclusively as investor-level phenomena. They may also emerge within managerial cognition and influence financing, investment, disclosure, and risk-taking decisions. This is especially important because managerial choices shape the information environment to which investors subsequently respond.

The model also identified fear, greed, regret, and loss aversion as contextual factors surrounding investors' affective and emotional decision-making. This result confirms that emotional states provide the environment through which cognitive biases may become stronger or weaker. Fear can increase risk avoidance and induce premature selling, while greed may lead to excessive risk-taking and speculative behavior. Regret can cause investors to delay loss realization or imitate recent market winners, whereas loss aversion may create a stronger response to negative outcomes than to comparable positive outcomes. Such asymmetry is central to behavioral finance because it explains why investors may react more intensely to potential losses than to equivalent gains [7]. The present findings also correspond with evidence showing that investor attitudes change markedly under geopolitical and crisis conditions, when emotional reactions become more pronounced [9].

The importance of emotional context is further supported by evidence from periods of extreme uncertainty. Nouri-Goushki and Hojaji demonstrated that herding behavior became particularly relevant in the context of COVID-19 and government policy responses, while Kartobi et al. documented asymmetric stock-market effects during the pandemic [10, 25]. These findings are consistent with the present model because they indicate that the behavioral response to negative shocks is not necessarily proportional or symmetric. Similarly, Tanos and Meharzi showed that herding and price-delay mechanisms can coexist in cryptocurrency markets, suggesting that social imitation can compound inefficient information processing [11]. Accordingly, the emotional and contextual components identified in the present study appear to operate not only at the individual level but also through collective market dynamics.

Another important result was the identification of several intervening corporate-finance mechanisms, including financial strategy formulation, corporate governance, risk management, capital structure optimization, access to financing, liquidity management, and optimal capital allocation. This finding indicates that behavioral biases and

emotions do not necessarily affect financial development directly; rather, their effects may be transmitted through organizational and financial-management mechanisms. Gharbi and Jarboui similarly found that behavioral biases are related to strategic decision-making in emerging-market settings, supporting the proposition that cognition and emotion can influence broader organizational choices rather than merely short-term trading behavior [26]. The present results therefore broaden the relevance of behavioral finance from individual investing to the design and implementation of corporate financial policy.

Corporate governance emerged as a particularly important intervening factor. Strong governance can limit opportunistic decision-making, improve monitoring, strengthen accountability, and reduce the influence of managerial overconfidence or self-interest. This interpretation is consistent with the view that organizational structures can moderate the behavioral tendencies of decision-makers and improve strategic discipline. The importance of governance is also evident when considering the relationship between information disclosure and managerial incentives. Yang et al. showed that corporate digital transformation can influence management's tone manipulation in information disclosure, indicating that managerial communication itself may be strategically biased [17]. If investors are simultaneously influenced by anchoring, confirmation bias, or emotional responses, such disclosure practices may amplify market misinterpretation. Consequently, governance mechanisms may play a dual role by constraining managerial bias and improving the informational environment available to investors.

The identification of access to financial resources, liquidity management, and capital structure optimization as intervening factors is also theoretically meaningful. Investor sentiment and managerial behavioral tendencies can affect the cost and availability of capital, while corporate financing decisions influence firm resilience and financial development. Hoang et al. showed that organizational complexity is associated with seasoned equity-offering decisions, highlighting the importance of internal corporate structure in financing behavior [22]. At the same time, Enow demonstrated the significance of illiquidity risk in international financial markets before and during the COVID-19 pandemic, suggesting that liquidity conditions can intensify the consequences of market stress [23]. These studies align with the present finding that behavioral and emotional pressures must be interpreted within the context of firms' financing and liquidity structures.

The role of information asymmetry constitutes another major explanatory mechanism for the findings. The model suggests that transparent ESG performance, corporate governance, and disciplined financial management can help reduce irrational behavior and improve financial outcomes. Previous research has demonstrated that asymmetric information is associated with earnings management and cost of equity [18], while Fambudi found that ESG disclosure, accrual quality, and information asymmetry are related to future stock returns [19]. These results support the present conclusion that information quality is central to reducing the behavioral consequences of uncertainty. When investors lack reliable information, they may rely more heavily on intuition, recent events, social signals, or emotionally charged interpretations. By contrast, higher-quality disclosure and stronger governance may reduce the informational conditions under which biases flourish.

The findings regarding ESG-related strategies are also supported by previous research on sustainable finance and information transparency. Bhue et al. showed that sustainable equity indices in emerging markets are characterized by patterns of connectedness and information asymmetry [20]. Zhang and Ding likewise linked green financial development to stock-price crash risk through an information-asymmetry perspective [21]. These findings reinforce the present study's proposal that transparent ESG performance may function as more than a reputational tool. It may also serve as a behavioral stabilizer by improving information quality, reducing uncertainty, and

encouraging more disciplined valuation. In this sense, ESG disclosure can potentially influence both managerial behavior and investor perception.

The strategies identified in the present study focused on emotional management, awareness of behavioral biases, financial planning, self-control, reduction of irrational herding, disciplined decision-making, strong governance, and transparent ESG performance. These strategies are consistent with the view that behavioral distortions can be mitigated by creating decision structures that reduce reliance on intuition and emotional reactions. Financial literacy is particularly relevant in this respect. Baker et al. showed that financial literacy plays an important role in the relationship between personality traits and investment biases [15]. The implication is that awareness and knowledge can partially protect decision-makers from behavioral errors, although they may not eliminate them entirely. Consequently, the present model's emphasis on recognizing bias and adhering to structured financial plans is consistent with earlier evidence.

The emphasis on disciplined decision-making also aligns with research on investor sentiment. Ali et al. demonstrated through structural equation modeling that investor sentiment can meaningfully shape stock-market decisions [8]. If sentiment affects market participation and investment choice, then strategies that increase self-awareness and reduce emotionally driven action can potentially improve decision quality. Furthermore, Arenas-Laorga and Capella showed that behavioral biases can influence the flow–performance relationship in mutual funds, indicating that even professionally intermediated investment settings are not immune to biased behavior [12]. The practical significance of the present findings therefore extends beyond individual investors to institutional and professionally managed environments.

The study also identified adverse consequences of behavioral and emotional biases, including speculative bubbles, severe crashes, excessive volatility, increased financing costs, financial crises, inefficient capital allocation, reduced returns, lost opportunities, stress, impaired judgment, and deviation from optimal investment decisions. These outcomes are consistent with previous research suggesting that irrational market behavior can distort price discovery and increase instability. Zheng questioned the assumption that financial markets are rational at all times, while Dwarika highlighted the complexity of the risk–return relationship and the need for more flexible approaches to modeling financial outcomes [2, 24]. These studies support the present conclusion that biased perceptions of risk and return may generate outcomes that cannot be fully explained through traditional rational models.

The adverse consequences are also consistent with evidence concerning crisis conditions and market participation. Maurya and Kumar's systematic review of retail and institutional participation in initial public offerings highlights the heterogeneity of investor behavior across market participants [13]. Qian similarly emphasized the distinctive role and behavior of institutional investors within financial markets [14]. Such heterogeneity suggests that behavioral distortions may have different consequences depending on the type of investor, access to information, professional expertise, and institutional constraints. Nevertheless, the present model indicates that even when behavioral responses differ across actors, their cumulative consequences can affect market stability and corporate financing conditions.

In contrast, the positive financial-development consequences identified in the model included reduced business-cycle intensity, increased factor productivity, reduced income inequality, lower financing costs, improved investment efficiency, better debt-maturity structures, reduced irrational price fluctuations, greater transparency, lower information asymmetry, stronger diversification and risk management, and increased market stability. These consequences suggest that effective behavioral management and stronger corporate-finance mechanisms may contribute to financial development beyond the firm level. Improved transparency and capital allocation can

support more efficient markets, while stronger governance and risk management can increase resilience. In this respect, the findings support the broader behavioral-finance argument that better understanding of psychological and organizational factors can contribute not only to individual investment performance but also to corporate and market-level outcomes [1, 3].

Overall, the results indicate that managers' asymmetric behavioral biases should be understood as part of an interconnected system rather than as isolated cognitive errors. Cognitive biases influence emotional decision-making, emotional factors shape the context of investor responses, corporate-finance mechanisms mediate the effects of these responses, and strategic interventions can either reduce or amplify their consequences. This integrated interpretation is consistent with Safaie et al., who emphasized the interrelations among investors' behavioral biases [6], and with Sundaram's systematic review, which highlighted the broad and multidimensional influence of behavioral biases on investment decision-making [4]. The primary contribution of the present study is therefore the integration of investor psychology, managerial decision-making, corporate financial mechanisms, and financial-development outcomes into a unified conceptual model.

The present study is subject to several limitations. First, the qualitative phase was based on the opinions of 24 experts, and although theoretical saturation was achieved, the findings remain dependent on the professional experiences, judgments, and interpretations of the selected participants. Second, purposive and theoretical sampling enhance conceptual depth but limit statistical generalizability to all managers, investors, industries, and capital markets. Third, the identified relationships are primarily conceptual and expert-based and therefore do not establish definitive causal effects among the proposed dimensions. Fourth, behavioral biases and emotional responses are dynamic and may vary according to market cycles, crisis conditions, investor experience, organizational culture, and regulatory environments. Finally, the model includes a broad set of behavioral, managerial, and financial factors, and the relative importance of each component may differ considerably across institutional and national contexts.

Future studies are recommended to test the proposed model quantitatively using large and diverse samples of managers, institutional investors, and retail investors. Structural equation modeling can be employed to evaluate direct, indirect, mediating, and moderating relationships among behavioral biases, emotional factors, corporate-finance mechanisms, and financial-development outcomes. Longitudinal studies would also be valuable for determining whether the strength of behavioral biases changes across bullish, bearish, and crisis periods. Cross-country comparative studies could assess the effects of institutional quality, regulatory systems, cultural differences, and market maturity on the proposed relationships. Experimental studies may further examine how managers and investors react to controlled variations in financial information, gains and losses, ESG disclosures, market shocks, and peer behavior. Future research may also distinguish between different types of investors and industries and investigate whether financial literacy, managerial experience, organizational culture, digitalization, or governance quality moderate the effects identified in the present model.

Managers, investors, financial institutions, and regulators should establish structured mechanisms for identifying and mitigating behavioral biases in financial decision-making. Firms can incorporate behavioral-risk assessments into strategic planning, capital budgeting, financing decisions, and risk-management systems. Managers should use standardized decision protocols, independent review processes, scenario analysis, and predefined financial criteria to reduce the effects of overconfidence, anchoring, and confirmation bias. Investors should be encouraged to adopt written investment plans, diversification rules, portfolio-rebalancing procedures, and predetermined thresholds for buying and selling rather than relying on emotionally driven judgments.

Organizations should strengthen corporate governance, improve the transparency and consistency of financial and ESG disclosures, and provide behavioral-finance and financial-literacy training for managers and investment professionals. Regulators and market institutions can also support more stable decision-making by improving disclosure standards, reducing information asymmetry, strengthening investor education, and developing monitoring systems capable of identifying excessive herding, speculative behavior, and abnormal market reactions.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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