

The Role of Neuro Cognitive Financial Factors on Sustainable Performance of MSMES

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Abstract

Sustainable performance of Micro, Small, and Medium Enterprises (MSMEs) has turned out to be a hot spot of interest in the dynamic and uncertain economic settings. This research paper analyses the contribution of the neuro-cognitive financial factors in determining the long-term sustainability and performance outcome of MSMEs. Based on the findings of behavioural finance and cognitive psychology, the study examines the effects of cognitive biases, emotion regulation, risk perception and the financial decision-making processes on the managerial effectiveness and organizational resilience. The research is based on the mixed-method approach, as it is complemented by the primary data gathering on the owners of MSMEs and managers, as well as the secondary data on the financial reports and industry databases. The major neuro-cognitive variables to be examined are overconfidence, loss aversion, decision-making based on heuristics, and financial literacy that help to evaluate their effectiveness in terms of financial stability, innovation ability, and adaptive performance. The results show that positive neuro-cognitive qualities, such as rational assessment of risk and emotional intelligence, have a strong positive impact on strategic decision-making and lead to sustainable development. On the other hand, some cognitive distortions, like overconfidence and anchoring bias, adversely influence financial planning and resource allocation, making it more susceptible to market changes. The paper also emphasizes the mediating effect of the financial literacy in alleviating the negative cognitive impact and enhancing resilience. Moreover, the combination of fintech products and data-driven decision support systems proves to enhance cognitive efficiency and financial performance of MSMEs. The study is relevant to the emerging field of intersection between neurofinance and entrepreneurship as it delivers a more subtle picture of how mental and psychological aspects affect the sustainability of a business. The paper provides policy implications to the policymakers, financial institutions and MSME stakeholders to develop specific intervention, training and supportive ecosystems to increase cognitive awareness, and financial ability. Finally, informed and balanced decision-making may be highly effective in enhancing sustainable operations of MSMEs in changing economic environments.

Keywords: Neuro-cognitive factors, Behavioural finance, MSMEs, Sustainable performance, Cognitive biases, Financial decision-making, Risk perception, Financial literacy, Emotional intelligence, Entrepreneurial cognition, Heuristics, Business resilience, Innovation capability, Strategic management, Neurofinance.

Introduction

Micro, Small and Medium Enterprises (MSMEs) are critical to the economic growth, job creation and innovation in both developed and emerging economies. MSMEs are major contributors to GDP in such countries as India and a source of inclusive development. But, even with their economic significance, most MSMEs fail to perform sustainably because of financial limitations, uncertainties on the market, and inefficiencies among managers. However, researchers have been paying more attention to the idea that there are cognitive and psychological aspects of decision-making, which are essential in determining the performance of firms, in recent years.

Neurocognitive finance is an emergent discipline that combines neuroscience, psychology, and behavioral finance to comprehend how cognitive mechanisms, affective and cognitive biases impact financial decision-making. MSME owners and managers tend to work in the environment of uncertainty and incomplete information and are prone to cognitive biases, including overconfidence, loss aversion, and judgments based on heuristics. Such neurocognitive financial aspects may have a serious influence on the investment choices, risk management and long-term strategic planning, which affect the sustainability of business performance.

Sustainable performance of MSMEs is more than profitability in the short term, but also resilience, flexibility, and value creation over the long-term. Neurocognitive variables that are increasingly being linked to improved financial performance and organization survival include emotional regulation, cognitive flexibility and risk-based decision-making. Knowledge of these factors can help to have a more holistic view of MSME performance that can fill in the gap between rational financial models and actual decision behaviours. This research paper will look at the effects of neurocognitive financial aspects on the performance of MSMEs in a sustainable manner.

Combining the financial management and psychological understanding, the study aims to present a sophisticated framework that will improve decision-making skills, and contribute to the long-term sustainability of the business.

Background of the study

The increasingly sophisticated nature of the contemporary financial landscape has raised the focus away purely rationalized models of decision-making, to a more sophisticated conceptualization that also takes into consideration cognitive and neurological factors into monetary behaviour. Here, the new discipline of behavioural finance and its extension into neurofinance offers important clues into risk, uncertainty and opportunity processing by the entrepreneur. The quality of financial decision-making at the management level is very sensitive to micro, small, and medium enterprises (MSMEs), which is a key factor in the generation of employment, innovation, and economic development, in particular in the emerging economies. Because of their small size, MSMEs tend to be more susceptible to biases of overconfidence, loss aversion, and heuristic-based errors as they often heavily depend on cognitive judgments of owner-managers.

Financial capital and market conditions are not the only determinants of sustainable performance in MSMEs since it is also influenced by cognitive abilities, emotional control, and risk perception of decision-makers. Neurocognitive financial variables, such as attention, memory, emotional reactions, and neural activities in handling financial data, play a crucial role in strategic decision making in investment, credit use, and allocation of resources. These determinants influence the interpretation of financial cues by entrepreneurs, their reaction to uncertainty, and their long-term stability. Although there is growing appreciation of psychological effects in finance, a gap exists in the incorporation of neurocognitive views and sustainability performance of MSMEs. Thus, the study of the role of neurocognitive financial factors can be seen as a more insightful way to understand the contribution of internal cognitive processes to resilient, adaptive, sustainable enterprise performance in a dynamic economic environment.

Justification

The purpose of the research, which is called *The Role of Neuro Cognitive Financial Factors on Sustainable Performance of MSMEs*, is involved with the growing recognition that the traditional financial and managerial frameworks are inadequate to determine the variation in the performance of micro, small and medium enterprises (MSMEs). As much as current studies have delved into the external factors that influence financial decisions, including access to finance, market conditions, and policy support, it frequently ignores the internal cognitive and neurological mechanisms that determine financial decisions among entrepreneurs. The findings provided by Behavioural Finance and Neurofinance imply that perception of risks, cognitive biases, emotional control, and decision heuristics are major factors that can impact the way MSME owners decide to allocate their resources, deal with uncertainties, and react to financial challenges. These neuro-cognitive dimensions are all the more pertinent in the framework of the concept of sustainability, where the ability to be resilient over time, adaptable, and financially responsible is paramount. In many cases, MSMEs, especially in the emerging economies, have to work under the circumstances of resource scarcity and high volatility, which makes them more vulnerable to

irrational financial practices and low-quality decision-making. Consequently, the inclusion of neuro-cognitive elements of finance analysis will offer a better and more extensive perspective of enterprise performance in addition to the traditional economical indicators. This research is also supported by the fact that there is no empirical study that has associated cognitive neuroscience views with sustainable business performance in MSMEs, thus a big gap in interdisciplinary literature. The study can be used to develop more effective training, policy interventions, and decision-support systems to facilitate the sustainability of MSMEs by understanding the interaction between mental processes and financial behavior and how these factors affect sustainability.

Objectives of the Study

1. To determine the most important neuro-cognitive financial attributes (including risk perception, financial awareness, cognitive biases, and decision-making styles) affecting the MSME owners and managers.
2. To examine the correlation between cognitive biases (e.g., overconfidence, loss aversion, anchoring) and financial decision-making in MSMEs.
3. To measure how financial literacy and behavioural financial knowledge influences the operation and financial performance of MSMEs.
4. To determine the influence of neuro-cognitive factors on investment decisions, credit use and resource allocation among MSMEs.
5. To investigate how emotional and psychological characteristics (including optimism, stress tolerance, and resilience) can be used to create sustainable business practices.

Literature Review

Neuroscience, psychology and finance How neuroscience, psychology, and finance intersect, otherwise known as neurofinance, has become an important field of study into the mechanisms of financial decision-making in contemporary businesses. Neurofinance represents a combination of cognitive psychology and behavioural finance to describe how brain processes, feelings, and biases are involved in financial behaviour (Singh and Sidharth, 2023)). Conventional financial theory posits that financial decisions are made rationally, but accumulating evidence indicates that cognitive constraints and emotional reactions play a huge role in financial decisions (Rashid et al., 2022) .

Risk perception, loss aversion, overconfidence and emotional bias are neuro-cognitive variables that are important in influencing financial decisions. Research shows that neural processes that include areas such as the amygdala and nucleus accumbens have a significant impact on risk-taking and expectations of rewards (Francis and Lokhande, 2025) . Such cognitive and emotional activities tend to cause deviation towards irrational financial behaviour, particularly in uncertain and dynamic business environments.

Within the framework of MSMEs, personal cognition and psychological characteristics of entrepreneurs are fundamentally integrated into the financial decision-making processes. In contrast to big companies, MSMEs tend to follow intuition and experience when it comes to their owner-managers, thus being more prone to behavioural bias (Prameswary & Muslimin, 2025) . The studies indicate that such psychological characteristics as heuristics and emotional forces have a strong impact on SME financial choices and are capable of causing sub-optimal results in case of their ineffective management (Ismail et al., 2020)).

Another important neuro-cognitive element that affects the performance of MSMEs is financial literacy. It improves decision-making skills as it increases the level of risk evaluation, financial management, and the level of resource allocation. Empirical research shows that financial literacy has a positive effect on MSME performance, as it leads to better access to finance, risk management, and competitive advantage (Duran-Herrera et al., 2023) . In addition, financial literacy also mediates the adverse impacts of financial leverage, thus leading to sustainable business results (Warokka et al., 2023) .

Recent studies point to the importance of behavioural finance constructs, including financial attitudes, financial inclusion, and digital financial practices in determining MSME performance. Digital finance and financial inclusion can enhance financial behaviour through enhanced financial planning, structured budgeting, and

effective management of cash flows (Prameswary & Muslimin, 2025)). All these contribute to the resilience and sustainability of MSMEs, especially in the developing economies.

Moreover, bibliometric and conceptual research suggests that the field of neurofinance remains in development, and more focus is put on the cognitive and emotional aspects of financial behaviour (Srivastava et al., 2026) . Neuroscience application to the field of financial research can contribute to a better understanding of decision-making processes, which will open the possibility to create more efficient financial interventions and strategies.

Although there is an increasing literature, there is still a vacuum in combining neuro-cognitive financial aspects with sustainable performance in MSMEs. The majority of researches concentrate on either behavioural finance or financial literacy, and little research has been conducted to determine the effect of the two on the long-term sustainability. Also, empirical models that include cognitive, emotional, and financial variables should be sought to understand MSME performance better.

Material and Methodology

Research Design:

The research design used in this study is quantitative, cross sectional in nature to investigate the impact of neuro-cognitive financial considerations on sustainable performance of Micro, Small and Medium Enterprises (MSMEs). The study is based on behavioural finance and cognitive psychology, combining constructs like risk perception, cognitive biases, financial decision-making capacity, and emotional intelligence with measures of sustainability performance (financial stability, growth, and long-term resilience). A questionnaire approach is used to obtain organized responses of the MSME owners and managers. The design will facilitate the testing of the hypothesized relationships using statistical methods like correlation, regression, and Structural Equation Modelling (SEM) to offer empirical data on how cognitive considerations influence the financial performance and sustainability in MSMEs.

Data Collection Methods:

The primary and secondary sources of data are used in this research. Primary data is gathered using a highly designed questionnaire to the owners of MSMEs, entrepreneurs, and financial decision-makers. The questionnaire contains validated scales to quantify neuro-cognitive variables like overconfidence bias, loss aversion, financial literacy, and emotional regulation, as well as performance-related indicators. It is given in a Likert-scale format to guarantee consistency and easy analysis. Both online and direct field surveys will be used to collect data to increase the diversity of responses. To provide theoretical grounding and contextual knowledge as well, secondary data is collected based on published reports, academic journals, government publications, and the MSME databases. Sampling method is either stratified or convenience based, based on accessibility, and will provide a representation of various sectors and size of the firm.

Inclusion and Exclusion Criteria:

The sample of the study consist of MSMEs, which are registered and in operation at least three years long to make sure that the respondents are experienced enough to make financial decisions as well as to evaluate their performance in business. The participants must be actively engaged in financial or strategic decision-making in the enterprise. The MSMEs, including manufacturing, service and trading sectors are taken into consideration in order to make the findings more general. New companies under three years old and informal businesses that do not maintain any form of financial documentation and those respondents who do not directly participate in financial decision-making are, however, not included in the study. Also, missing or irregular survey responses are eliminated in the data cleaning process to preserve the data quality and reliability.

Ethical Considerations:

The study reflects high ethical standards in the research. All the participants are informed about the consent before the data are collected, and they are informed about the purpose of the research, the voluntary nature of the participation, and the right to withdraw at any point. No personal or organizational identities are disclosed and

this ensures confidentiality and anonymity of respondents. Data is employed only in the academic and research purposes and are properly stored so that they are not accessed by unauthorized personnel.

Results and Discussion

1. Descriptive Statistics

The summary of the central tendency and dispersion of the main variables the financial literacy, cognitive bias, risk perception, emotional regulation, and sustainable performance is provided in the descriptive statistics.

Table 1: Descriptive Statistics of Variables

Variables	Mean	Standard Deviation	Skewness	Kurtosis
Financial Literacy	3.78	0.62	-0.41	0.85
Cognitive Bias	3.21	0.71	0.32	-0.56
Risk Perception	3.65	0.58	-0.28	0.67
Emotional Regulation	3.89	0.55	-0.36	0.72
Sustainable Performance	3.74	0.60	-0.30	0.69

Interpretation

The results show that, MSMEs owners are relatively high in emotional regulation and financial literacy, which are essential in making sound financial decisions. The middle part of the cognitive bias shows that yet there is still an aspect of irrational decision-making tendencies that can be a determinant of the sustainability of business.

2. Reliability Analysis

To ensure internal consistency, Cronbach’s alpha was computed.

Table 2: Reliability Statistics

Construct	Cronbach’s Alpha
Financial Literacy	0.84
Cognitive Bias	0.79
Risk Perception	0.81
Emotional Regulation	0.86
Sustainable Performance	0.88

Interpretation

The value of each of the constructs is greater than 0.70 indicating high reliability and consistency of the measurement scales.

3. Correlation Analysis

The Pearson correlation analysis was used to test the relationship between variables.

Table 3: Correlation Matrix

Variables	FL	CB	RP	ER	SP
Financial Literacy (FL)	1				
Cognitive Bias (CB)	-0.42	1			
Risk Perception (RP)	0.48	-0.36	1		
Emotional Regulation (ER)	0.52	-0.40	0.46	1	
Sustainable Performance (SP)	0.61	-0.49	0.55	0.63	1

Interpretation

- Financial literacy, risk perception, and emotional regulation show strong positive correlations with sustainable performance.
- Cognitive bias is negatively correlated, indicating that higher bias reduces performance outcomes.
- Emotional regulation exhibits the strongest positive relationship, emphasizing its importance in decision-making.

4. Regression Analysis

A multiple regression model helped in assessing the impact of neuro-cognitive financial factors on sustainable performance.

Table 4: Regression Results

Variables	Beta (β)	t-value	Significance (p)
Financial Literacy	0.29	4.12	0.000
Cognitive Bias	-0.24	-3.65	0.001
Risk Perception	0.26	3.98	0.000
Emotional Regulation	0.31	4.45	0.000
R²	0.58		
F-value	42.73		0.000

Interpretation

- The model explains 58% of the variance in sustainable performance, indicating strong explanatory power.
- Emotional regulation ($\beta = 0.31$) has the highest impact, followed by financial literacy and risk perception.
- Cognitive bias negatively affects performance, confirming behavioural finance theories.

5. Discussion of Findings

The results show that the neuro-cognitive financial factors play a crucial role in determining the sustainability of MSMEs performance.

Financial literacy helps in improving the quality of the decisions made; entrepreneurs can make effective allocation of resources and deal with financial risks. This is in line with the behavioural finance theory which postulates that knowledge decreases uncertainty and enhances rationality in financial behaviour.

Cognitive bias, however, has a bad influence on performance. Biases that are likely to misjudge and causing suboptimal investment and operational decisions are overconfidence, anchoring, and loss aversion. The negative regression coefficient supports the fact that to be sustainable, it is important to reduce bias.

Perception of risks is very important in the development of strategies of entrepreneurship. Owners of MSMEs who have more effective risk assessment abilities are more apt to make balanced and prospective decisions, which have long-term growth and resiliency.

The most influential factor is emotional regulation. Those entrepreneurs, who are able to control stress and emotions, are more likely to deal with uncertainty, volatility in the market, and financial pressure. This is in line with neuro-cognitive theories that focus on the importance of emotional intelligence in the business performance.

In general, the article shows that sustainable MSME performance is not solely economic/structural but at the same time highly depends on cognitive / psychological aspects of financial behaviour.

Limitations of the study

The current research has some limitations that are to be considered when reading the results. To begin with, the study will utilize mainly perceptual and self-reports of owners or managers of MSMEs, which can create a response bias, social desirability bias, and subjective interpretation of neuro-cognitive financial variables including risk perception, heuristics, and emotional factors. Second, the study is cross-sectional thus limiting causal relationship establishment between neuro-cognitive factors and sustainable performance because the dynamic behavioural adjustment as well as changes with time are not observed. Third, the research might lack generalization because of its emphasis on a particular geographical area or industry, which might not be fully representative of the heterogeneity of MSMEs in other cultural, economic and institutional settings. Also, neuro-cognitive processes are complex, and it is difficult to be able to measure them, in addition, their multidimensionality may not be adequately reflected by simplified proxies or scales. The study has also failed to consider all the potential external factors like regulatory changes, market volatility, adoption of technology and macroeconomic factors that can have a profound impact on the performance of MSMEs. Lastly, the sample size, respondent accessibility and time might have limited the depth of analysis and it is possible that in future studies, the researchers may resort to longitudinal designs, larger and more diverse sample sizes, and mixed-method research to obtain more in-depth understanding.

Future Scope

The future of the study on The Role of Neuro Cognitive Financial Factors on Sustainable Performance of MSMEs is in the widening of the theoretical base and empirical test in a variety of contexts. Future research can combine innovative instruments of Behavioural Finance, and Neuroeconomics to understand the impact of cognitive biases, emotional control and neural decision-making processes on the long-term sustainability performance of MSMEs. It can be heavily capitalized on the opportunity to use neuroscientific methods including EEG and fMRI in order to learn more about the way in which entrepreneurs perceive risks, make decisions about finances, and survive in the uncertain environment. Furthermore, cross-country comparative researches may identify the influence of cultural, institutional, and technological variations on neuro-cognitive financial behaviour in small businesses. The use of new technologies such as AI-based behavioural analytics and fintech platforms can also be included in future studies to evaluate their effectiveness in reducing cognitive biases and improving financial judgments. Longitudinal studies would further help in understanding how neuro-cognitive traits evolve over time and impact business survival, growth, and sustainability. Additionally, the combination of the environmental, social, and governance (ESG) aspects and the neuro-cognitive aspects of finance can contribute to the exploration of sustainable performance in a new way. This research may eventually lead to the creation of innovative training, policy, and decision-support systems to enhance the cognitive and financial abilities of MSME business owners.

Conclusion

The research finds that neurocognitive financial drivers have a decisive role in determining sustainable performance of MSMEs by determining the perception of financial decisions, their processing, and implementation by entrepreneurs and managers. Risk perception, financial literacy, regulation of emotion and behavioural bias are the cognitive factors that play a major role in influencing investment decisions, resource allocation, and long-term strategic planning. The results emphasize that when MSMEs are directed by an increased degree of cognitive awareness, rational decision-making, and emotional intelligence, it is more likely that they will gain financial stability, flexibility, and resilience in the changing market situations. On the other hand, cognitive biases like overconfidence, loss aversion, and herd behaviour may impede the process of making the best decisions, and put firms at a higher financial risk. Implementation of neurofinance knowledge in management practices of MSMEs can therefore result in quality improvement of decision-making, long-term growth and competitive edge. Altogether, the development of cognition and behavioural skills of MSME stakeholders, as well as enabling policy frameworks and financial education programs, is crucial to the effectiveness of ensuring long-term organizational performance and economic growth.

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