Role of Prospect Theory in an Insurance Company's Investment: A Behavioural Finance Study in Karnataka

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Abstract

Prospect Theory, a seminal theory in behavioural economics and finance, was developed by psychologists Daniel Kahneman and Amos Tversky in 1979. This theory serves as a fundamental framework for understanding decision-making under conditions of risk and uncertainty, a central focus of this study regarding investment decision-making in insurance companies. Behavioural finance, which studies how psychological factors influence financial decision-making, has significant implications for the insurance industry. With an emphasis on behavioural finance theories, this research paper investigates the part played by prospect theory in the investment choices made by insurance businesses active in the state of Karnataka. A key idea in behavioural finance is prospect theory, which looks at how people and organisations behave when faced with risk and uncertainty. The research paper seeks to identify specific behavioural biases, such as loss aversion and the disposition effect, which might affect investment choices in the insurance industry. To explore the psychological aspects of investment decisions, quantitative research techniques, including the Cronbach Alpha Test of reliability, are employed. The study develops, recommends, and validates a conceptual framework for investment decision-making, utilising a Structural Equation Model (SEM). The research offers a comprehensive exploration of investment decision-making within insurance companies, combining literature review, empirical analysis, quantitative research, and the development of a practical conceptual framework. The research spotlights the presence of specific psychological biases like amplified aversion to losses, a tendency to approach potential gains with caution, and a propensity for risk-seeking behaviour when faced with potential losses. It has been unveiled that insurance companies tend to adopt investment strategies that correlate with the principles of Prospect Theory. Social Implication: It seeks to provide useful insights to practitioners, policymakers, and academics interested in improving investment strategies and risk management in this field by bridging the gap between behavioural finance and the insurance industry.

Keywords: *Behavioural Finance, Loss Aversion, Prospect Theory, Risk Tolerance*

Introduction

Prospect Theory, a seminal theory in behavioural economics and finance, was developed by psychologists Daniel Kahneman and Amos Tversky in 1979. This theory serves as a fundamental framework for understanding decision-making under conditions of risk and uncertainty, a central focus of this study regarding investment decision-making in insurance companies.

The theory emphasises the significance of reference points in decision-making. People tend to evaluate outcomes in relation to a reference point, such as their initial investment or a recent high-water mark. Gains and losses are assessed relative to this reference point, impacting investment choices. Prospect Theory offers an S-shaped value function, depicting how individuals assess potential outcomes. This function illustrates that people evaluate gains and losses in a nonlinear manner, with small gains or losses exerting a disproportionately significant influence on decision-making. This research paper is driven by the critical importance of investment decision-making within insurance companies. These decisions not only profoundly impact the financial health of these institutions but also hold significant implications for policyholders and the overall stability of the insurance sector.

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Ultimately, the motivation lies in contributing to the financial stability and security of insurance companies, policyholders, and the broader insurance industry. By shedding light on the grey areas of investment decisions, we aim to fortify the sector's resilience and prosperity. Investment decisions within insurance companies constitute a critical juncture where financial theories, behavioural intricacies, and regulatory frameworks intersect. This study explores the intricate realm of investment decision-making, particularly in the context of Karnataka, to understand the interplay of factors that influence these decisions. The fundamental question at the core of this research is how these multifaceted elements converge to shape investment choices, and, crucially, how this understanding can be applied to enhance investment strategies. In a contemporary landscape characterised by financial market dynamism and evolving regulatory paradigms, the significance of effective investment practices within insurance companies cannot be overstated. This research aspires to transcend theoretical constructs and contribute practically by bolstering the financial stability of these institutions and ensuring the protection of policyholders' interests.

Literature Review

The complexities of venture decision-production inside an insurance agency bear importance that arrives at a long way past the singular establishments included. The nation's overall economic well-being is significantly impacted by the insurance industry's financial stability. Successful venture rehearses inside this area have the possibility to invigorate monetary development, give upgraded monetary security to policyholders, and build the area's ability to mitigate fundamental monetary dangers at a national scale. Besides, the administrative systems directing venture choices within insurance elements are frequently firmly interlaced with or affected by public contracts and mandates. An extensive comprehension of these systems and their viability becomes significant in forming and calibrating public monetary guidelines. The frameworks that govern investment decisions within insurance entities frequently draw from established global standards and international agreements within the realm of international regulations. Getting a handle on the working of these systems and their arrangement with best practices on a worldwide scale is crucial for guaranteeing the consistent activity of global money. Additionally, when viewed through an international lens, the findings of this study have the potential to enhance the collective knowledge base of global financial markets. Understanding how to streamline venture procedures inside insurance agency can cultivate widespread prescribed procedures that rise above public lines, ultimately building up the strength of the overall economic framework.

"Impact of Financial Literacy and Investment Experience on Risk Tolerance and Investment Decisions: Empirical Evidence from Pakistan" (Awais *et al*., 2016) - Examines how financial literacy and experience affect investment decisions in Pakistan.

"Market Estimation of a Prospect Theoretic Value Function" - focuses on market estimation related to prospect theory's value function.

"Establishing a link between risk tolerance, investor personality and behavioural finance in South Africa" (Dickason & Ferreira, 2018) - Explores the interplay between risk tolerance, investor personality, and behavioural finance in South Africa.

"Factors that Influence Financial Literacy: A Conceptual Framework" (Firli, 2017) - Presents a framework to understand the factors influencing financial literacy.

"Performance of selected Bank Mutual Fund Schemes impact in investor's decision" (Gandhi & Perumal, n.d.)- Analyses the performance of bank mutual fund schemes and their impact on investor decision-making.

"Consequences of human behaviours in Economics: The Effects of Behavioural Factors in Investment decision making at Tehran Stock Exchange" (Ghayekhloo & Rasol Masomi, n.d.) - Investigates how behavioural factors influence investment decisions at the Tehran Stock Exchange.

"Antecedents to heuristics: decoding the role of herding and prospect theory for Indian millennial investors" (Goyal *et al*., 2023) - Explores the role of herding and prospect theory in investment decisions of Indian millennial investors.

"Prospect Theory and Mutual Fund Flows" (Gu & Yoo, n.d.) - Examines the influence of prospect theory on mutual fund flows.

"A prospect theory approach to assessing changes in parameters of insurance contracts with an application to money-back guarantees" (Heiman *et al*., 2015) - Utilises prospect theory to assess changes in insurance contract parameters, specifically money-back guarantees.

"Financial Literacy and Personal Financial Planning in Klang Valley, Malaysia" (Hui BooN *et al*., 2011) - Investigates financial literacy and personal financial planning in the Klang Valley, Malaysia.

"Factors Affecting Investment Decision Making: Evidence from Equity Fund Managers and Individual Investors in Pakistan" (Sajid et al., 2015) - Explores

factors influencing investment decisions among equity fund managers and individual investors in Pakistan.

"A Multi-Objective Decision-Making Approach for Mutual Fund Portfolio" (Sharma, 2006)- Presents a multi-objective decision-making approach for optimising mutual fund portfolios.

"The correct formula of 1979 prospect theory for multiple outcomes" (Wakker, 2023)- Investigates the correct formula for 1979 prospect theory concerning multiple outcomes.

"The impact of shared financial decision making on overconfidence for married adults" (Warmath et al., 2019) - Examines how shared financial decision-making affects overconfidence among married adults.

This presents an extensive exploration of various research studies, theoretical frameworks, and empirical findings about investment decision-making within insurance companies. It commences by dissecting the foundational tenets of Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM), serving as the cornerstones of investment strategies. The review then transitions into the realm of behavioural finance theories, with a particular focus on Prospect Theory, elucidating how cognitive biases and emotional factors impact the intricate landscape of investment choices. Furthermore, it investigates the pivotal roles played by financial advisors, regulatory constructs, and individual determinants like risk tolerance, financial acumen, and age in the configuration of investment decisions. Additionally, the review underscores the imperative of harmonising investment strategies with long-term financial objectives and accentuates the necessity for flexible conceptual frameworks. Throughout, it emphasises the intricate interplay of variables that Mould investment decisions within insurance firms, establishing a robust foundation for the ensuing research study.

Research Methodology

The research employs a multifaceted approach to gain a holistic understanding of this domain. It begins with an extensive literature review, providing a thorough synthesis of existing knowledge and insights. Following this, empirical data is collected through a pilot study and a structured survey, where questionnaires are used to identify and analyse the factors that significantly influence individual investors' choices in insurance companies' mutual funds. To explore the psychological aspects of investment decisions, quantitative research techniques, including the Cronbach Alpha Test of reliability, are employed. This analysis establishes a quantifiable link between prospect theory and investment patterns among individual investors in the insurance sector.

Finally, the study develops, recommends, and validates a conceptual framework for investment decision-making, utilising a SEM. This framework captures the complex interplay of various factors that affect investment choices and undergoes rigorous statistical validation to ensure its accuracy and practicality. In summary, this research offers a comprehensive exploration of investment decision-making within insurance companies, combining literature review, empirical analysis, quantitative research, and the development of a practical conceptual framework.

Objectives

1. To identify and analyse various factors affecting individual investors in insurance companies on mutual funds.
2. To establish the association between prospect theory and individual investment patterns/decisions.
3. To recommend and validate the conceptual framework for investment decisions in insurance companies.

Hypothesis

H1: There is a significant impact of behavioural biases on investment patterns.

H1: There is a significant impact of risk perception on investment choices and decisions.

H1: There is a significant impact of external economic factors on investment decisions.

H1: Investors demonstrate awareness and understanding of the prospect theory concepts.

Result and Discussion

Descriptive Statistics

- The mean values for all five factors (RT, FS, POR, FA, BB) are close to each other, ranging from 4.6405 to 4.6779. This suggests that, on average, these factors have similar scores or values across the dataset of 385 observations. The relatively high mean values (all above 4.6) suggest that the participants (or subjects in the data) consistently rated or scored these factors quite highly. The standard deviations for the factors range from 0.4059 to 0.4383, which indicates moderate variability around the mean. This implies that while most of the data points are relatively close to the mean, there is still some variation.
- FA (with a standard deviation of 0.4383) shows slightly more variability than the other factors, indicating that the scores for this factor vary more widely across the observations.

Table 1. Table showing the descriptive statistics of the study

Factors	RT	FS	POR	FA	BB
Mean	4.6664935	4.6462338	4.6685714	4.6405195	4.6779221
Std Dev	0.4058741	0.4257868	0.4164261	0.4382966	0.412002
Std Err Mean	0.0206853	0.0217001	0.021223	0.0223377	0.0209976
Upper 95% Mean	4.7071641	4.6888997	4.7102993	4.6844389	4.7192067
Lower 95% Mean	4.625823	4.6035679	4.6268435	4.5966	4.6366375
N	385	385	385	385	385
N Missing	0	0	0	0	0

- RT has the lowest standard deviation (0.4059), indicating more consistent scores or less variation among the participants for this factor.
- The standard error of the mean for all factors is quite small, ranging from 0.0207 to 0.0223. This suggests that the sample means are estimated with high precision and that we can be relatively confident in the accuracy of these mean estimates.
- RT has the lowest standard error (0.0207), suggesting the highest precision for the mean estimate of this factor. The 95% confidence intervals for the mean values of each factor are narrow, indicating a high degree of confidence that the true mean lies within a small range around the sample mean. Since all of the confidence intervals overlap significantly, it suggests there may not be a statistically significant difference between the means of these factors, at least based on the confidence intervals alone. The sample size is large (385 observations for each factor), which contributes to the precision of the estimates (as seen from the small standard errors and narrow confidence intervals).
- There are no missing data points, which strengthens the reliability of the analysis.

Table 2 shows the reliability metrics for the latent variables RT, FS, POR, FA, and BB based on the values from the CFA analysis. Both Omega and H indicate strong reliability for all constructs. This measures how well each indicator reflects its underlying latent variable (RT, FS, POR, FA, BB). Composite Reliability (Ω) is a measure of the overall reliability of the latent variables, capturing the internal consistency of the indicators. A higher coefficient omega (closer to 1) indicates better reliability and internal consistency.

- RT: Ω = 0.9124
- FS: *Ω = 0.9344*
- POR: *Ω = 0.9303*
- FA: *Ω = 0.9504*
- BB: *Ω = 0.9283*

Table 2. Table summarising the Confirmatory Factor Analysis (CFA) results

Latent Variable	Omega (Composite Reliability)	H (Construct Maximal Reliability)	Reliability
RT	0.9124	0.915	Highly Reliable
FS	0.9344	0.9368	Highly Reliable
POR	0.9303	0.9314	Highly Reliable
FA	0.9504	0.9519	Highly Reliable
BB	0.9283	0.9292	Highly Reliable

All these values indicate excellent reliability, as they are all well above the commonly accepted threshold of 0.70. Maximal Reliability (H), also known as Hancock's H, is a more conservative estimate of reliability compared to omega, and it considers the factor loadings directly. A higher coefficient H (closer to 1) similarly suggests strong reliability for the construct.

- RT: *H = 0.9150*
- FS: *H = 0.9368*
- POR: *H = 0.9314*
- FA: *H = 0.9519*
- BB: *H = 0.9292*

Again, all these values are well above 0.70, showing strong construct reliability.

Table 3 provides the eigenvalues for each factor, along with the percentage of variance explained and the cumulative variance explained up to each factor.

- Factor 1:
  - Eigenvalue: 17.8890, which explains 71.56% of the total variance.

Table 3. Table showing the eigenvalue and per cent of variability

Factor Number	Eigenvalue	Per cent of Variance	Cumulative Percent
1	17.889	71.556	71.556
2	0.6407	2.563	74.119
3	0.5924	2.37	76.488
4	0.4967	1.987	78.475
5	0.4449	1.78	80.255
6	0.4277	1.711	81.966
7	0.4137	1.655	83.62
8	0.406	1.624	85.244
9	0.3802	1.521	86.765
10	0.3227	1.291	88.056
11	0.2976	1.191	89.247
12	0.2838	1.153	90.4
13	0.2437	0.974	91.374
14	0.2374	0.95	92.459
15	0.2344	0.938	93.408
16	0.2224	0.89	94.298
17	0.2069	0.834	95.132
18	0.184	0.736	95.96
19	0.1763	0.705	96.665
20	0.1457	0.582	97.247
21	0.1293	0.517	97.764
22	0.1221	0.488	98.251
23	0.1213	0.485	98.736
24	0.1128	0.451	99.187
25	0.0877	0.351	100

    - This high eigenvalue suggests that the first factor is extremely important and explains a large portion of the variance in the dataset.
- Factor 2:
    - Eigenvalue: 0.6407, explaining 2.56% of the variance.
    - The significant drop in eigenvalue after the first factor indicates that Factor 2 is much less important in explaining the overall variance.
- Factors 3 to 25:
    - All subsequent factors have eigenvalues less than 1 and explain progressively smaller portions of the variance (ranging from 2.37% to 0.35%).
    - According to the Kaiser criterion, factors with eigenvalues below 1 should generally be discarded, as they explain less variance than an individual variable would.

The first factor has an eigenvalue of 17.8890, explaining over 71% of the variance. This suggests that the dataset is largely explained by one underlying factor or dimension. All other factors (Factor 2 and beyond) have eigenvalues below 1 and explain only a small portion of the variance (each contributing less than 3%). Factors beyond the first explain a cumulative total of 28.44% of the variance, meaning that these additional factors contribute little to the model›s explanatory power. • Based on both the Kaiser criterion (retain factors with eigenvalues > 1) and the scree plot, only Factor 1 is worth retaining. The remaining factors explain minimal additional variance and can likely be discarded. This suggests that the data can be modelled effectively with just one factor, simplifying the structure and interpretation of the analysis. By retaining only Factor 1, you significantly reduce the complexity of the model while capturing the majority of the variance. This can lead to a more interpretable and parsimonious solution.

Table 4 reflects the relationships between the latent variables (FA, RT, FS, POR and BB), and their associated factors with corresponding path coefficients.

1. Latent Variables (FA, RT, FS, POR, BB):
    - These represent underlying constructs that are not directly measured but are inferred through several observed indicators.
2. Observed Variables:
    - These are the variables that are directly measured via surveys or assessments. Each observed variable has a corresponding latent variable.
3. Path Coefficients:
    - The numbers on the arrows (e.g., 0.853, 0.865, etc.) represent standardised regression weights or factor loadings, which indicate the strength of the relationship between the latent and observed variables.
    - Higher values (closer to 1) suggest that the observed variable is a strong indicator of the latent variable.
4. Error Terms:
    - The small circular icons with arrows pointing to the observed variables represent error terms. These account for measurement error or variability that is not explained by the latent variable.

Figure 1. Structural equation modelling.

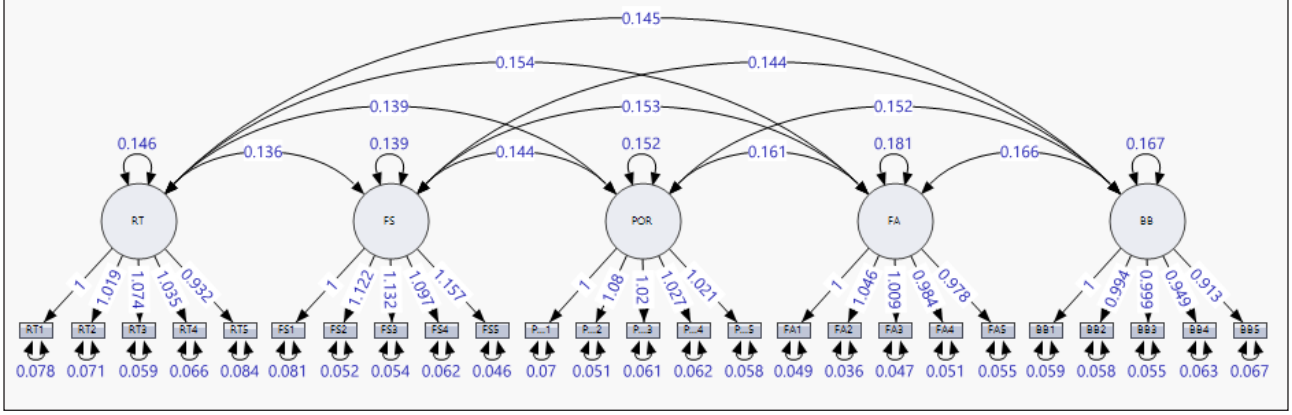


Table 4. Table reflecting the relationship between latent variables and their associated factors

Latent Variable 1	Latent Variable 2	Path Coefficient
FA	RT	0.181
FA	FS	0.104
RT	POR	0.853
RT	BB	0.945
FS	POR	0.865
POR	HR	0.054
POR	WI	0.063
POR	TR	0.061
POR	SR	0.059
BB	R	0.059
BB	RL	0.06
BB	AL	0.053

Inferences:

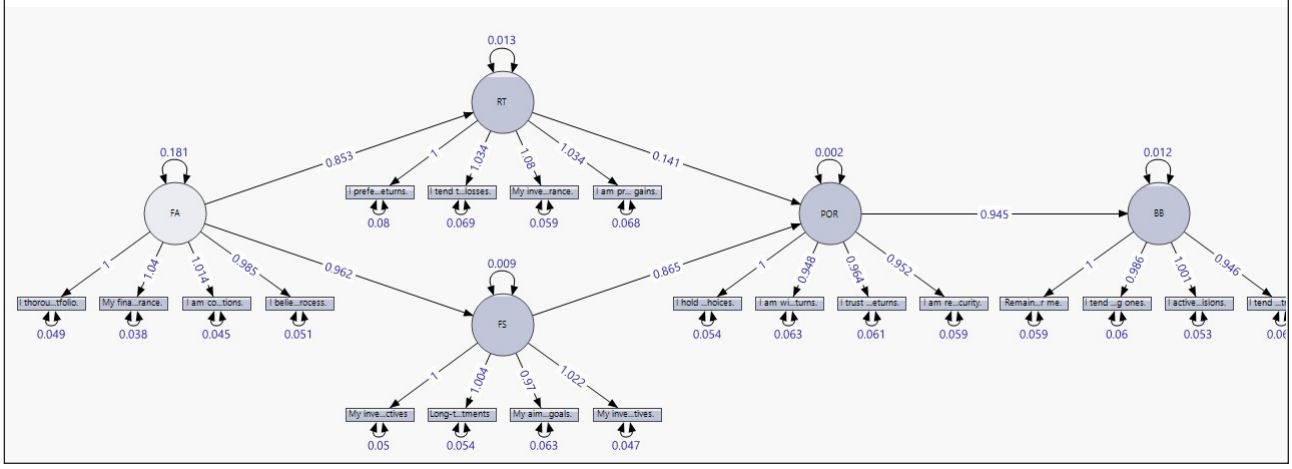
1. Factor Loadings:
   - All latent variables (FA, RT, FS, POR, BB) have high factor loadings with their respective observed variables. The strength of these relationships indicates good model fit and that the observed variables are strong indicators of their respective latent factors.
2. Inter-Construct Relationships:
   - «FA» (Financial Attitudes) has a positive impact on «RT» (Risk Tolerance) and «FS» (Financial Stability).
   - «POR» (Portfolio Orientation) affects «BB» (Behavioural Biases) with a path coefficient of 0.945, indicating a very strong relationship.
3. Variance Explained:
   - Lower values might indicate the latent variable is influenced by other factors not included in the model
   - This model suggests that FA strongly influences RT and FS. In turn, POR significantly drives BB.
   - The model›s path coefficients show strong relationships between latent variables and their respective indicators, suggesting that the data fit the model well.
   - A high loading between «POR» and «BB» suggests that an individual›s orientation toward their portfolio heavily influences their behavioural biases in investment decisions.

A positive correlation between all the factors in a SEM indicates a scenario where, as one factor increases, the others tend to increase as well. In other words, when one variable goes up, the others tend to follow suit, and when one variable goes down, the others tend to decrease in tandem. This correlation pattern suggests a harmonious or synergistic relationship among the factors under consideration in the model.

Loss aversion typically results in a value greater than 1, indicating that losses have a stronger psychological impact than equivalent gains. This concept captures the tendency for people to avoid losses at a higher cost compared to their willingness to pursue gains.

The study also focuses on the two reference points being Risk Tolerance and financial Strategies, which shows the relation between the two factors with behavioural bias. The study has extended further, showing that there is a positive impact on loss aversion based on prospect theory.

Figure 2. Structural equation modelling.



It's important to note that the exact formulation and parameters of Prospect Theory can vary based on the context and the specific mathematical model being used. The formula provided above represents a simplified version of loss aversion within Prospect Theory.

A positive correlation between all the factors in a SEM indicates a scenario where one factor increases, and the others tend to increase as well. In other words, when one variable goes up, the others tend to follow suit, and when one variable goes down, the others tend to decrease in tandem. This correlation pattern suggests a harmonious or synergistic relationship among the factors under consideration in the model.

It underscores the need for adaptability and provides historical validation, reinforcing the framework's practicality in achieving financial objectives while managing risk.

These key findings and contributions collectively provide a comprehensive understanding of investment decision-making in insurance companies, offering valuable insights for both industry professionals and policymakers. They bridge the gap between theoretical concepts and practical implications, with the potential to optimise investment strategies and enhance financial security.

Summary of Findings

- Individual investors in insurance companies prioritise financial goals, with wealth accumulation and capital preservation being prominent.
- Age significantly influences investment preferences, with younger investors displaying a higher risk appetite. Financial literacy plays a pivotal role in shaping investment choices. Financial advisors have a substantial impact on guiding investment decisions for individual investors.
- It emphasises the importance of financial literacy and the influential role of financial advisors in guiding investment choices.
- Prospect theory principles are evident, with investors displaying a stronger aversion to losses than eagerness for equivalent gains. Loss aversion often leads to the reluctance to sell losing investments.
- The proposed conceptual framework, emphasising risk tolerance, financial goals, and regulatory compliance, aligns with observed practices within insurance companies.
- The framework stresses the importance of adaptability and flexibility in investment decisions.
- Validation through historical portfolio performance demonstrates the framework's effectiveness in balancing risk and return.
- It underscores the need for adaptability and provides historical validation, reinforcing the framework's practicality in achieving financial objectives while managing risk.
- These key findings and contributions collectively provide a comprehensive understanding of investment decision-making in insurance companies, offering valuable insights for both industry professionals and policymakers. They bridge the gap between theoretical concepts and practical implications, with the potential to optimise investment strategies and enhance financial security.

Conclusion

In this extensive study, we have delved deeply into the realm of investment decision-making within insurance

companies, with a specific focus on the influential role played by Prospect Theory. The research has been dedicated to unravelling the intricate behavioural aspects underpinning investment choices within Karnataka, India's insurance sector.

The investigative journey has yielded substantial insights into the nuanced connection between Prospect Theory and investment patterns in insurance companies.

Suggestions for Future Work

While this research makes valuable contributions to understanding investment decision-making in insurance companies within the Karnataka region, it also opens doors to several avenues for future research and exploration:

Cross-Regional Studies: To expand the applicability of the findings, future studies could explore investment decision-making in insurance companies across different regions, considering the variations in regulatory environments, economic conditions, and investor demographics. Longitudinal Analysis: Conducting long-term studies over several years could provide insights into how investment decisions evolve and how they are influenced by changing market conditions and regulatory dynamics.

Qualitative Research: Complementing quantitative data with qualitative research methods, such as in- depth interviews and focus groups, can provide deeper insights into individual investors' and insurance professionals' behavioural biases and decision-making processes.

Comparative Analysis: Future studies could compare the investment strategies and outcomes of insurance companies with those of other financial institutions, such as pension funds or mutual funds, to identify best practices and areas for improvement.

Behavioural Interventions: Research could delve into the effectiveness of behavioural interventions, such as nudges or education programs, in mitigating behavioural biases and improving investment decision-making within insurance companies.

Regulatory Impact: Investigate how changes in regulatory frameworks impact investment decisions within insurance companies and assess whether these changes enhance investor protection and market stability.

Machine Learning and Predictive Analytics: Utilise advanced analytics and machine learning techniques to predict investment decisions based on a combination of behavioural, demographic, and economic factors, aiding insurance companies in portfolio management.

Global Comparisons: Conduct international comparisons to understand how investment decisions in insurance companies differ across countries with varying regulatory structures and cultural influences.

Financial Advisor Effectiveness: Explore the impact of financial advisors on investment choices in more detail, including their recommendation strategies, client interactions, and the value they add to the investment decision-making process.

Digital Transformation: Investigate how advancements in technology, such as robot-advisors and digital platforms, influence investment decisions in insurance companies and their clients.

Sustainable and ESG Investing: Examine how Environmental, Social, and Governance (ESG) considerations are integrated into investment decisions within insurance companies, reflecting the growing importance of sustainability.

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