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EMPIRICAL STUDY ON THE ROLE OF ARTIFICIAL INTELLIGENCE IN MITIGATING BEHAVIOURAL BIASES AMONG INDIAN RETAIL INVESTORS

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Abstract:

Democratization of the Indian equity market has spurred considerable growth in retail investor participation; however, the vast majority of retail investors do not outperform the benchmark Nifty 50 index. Most of these retail investors underperform relative to their benchmark due to irrational decision-making habits (i.e., psychological heuristics). The purpose of this study was to collect primary data from 75 Indian retail investors in order to assess the extent to which these individuals experience fear, greed, and herd mentality in their decision-making processes. The results of this study indicate that panic selling (Mean = 3.89) and herd impact (Mean = 3.84) are most prevalent among Indian retail investors in addition to a large awareness-action gap. In addition to fear, greed, and herd mentality, we also evaluated various artificial intelligence (AI) based tools that are currently available to the retail investor; specifically, we evaluated the effectiveness of automated rebalancing (Mean = 4.21) and risk alerts (Mean = 4.17) as effective rational circuit breakers. We were able to conclude that while human emotion is an integral part of the decision-making process, the use of AI allows retail investors to maintain discipline while investing during times of market volatility.

Keywords: *Behavioural Bias, Emotional Trading, Artificial Intelligence, Retail Investors, Herd Behaviour*

Introduction:

The Indian Financial Landscape has transformed dramatically in the last three years. From less than 100 million accounts at the start of 2020 to over 150 Million Accounts now - mostly due to the availability of Internet and Technology (the "fintech boom"), millions of new retail market participants have arrived into the stock exchanges (BSE and NSE) for the first time. However, new entrants into the market are entering without being educated about the stock markets or investing in general.

Although traditional finance has had its basis on EMH (the Efficient Market Hypothesis), which demonstrates that the average individual is an economic (i.e., rational) utility maximiser, the context here is somewhat different; majority retail investors participate emotionally during periods of high retail market participation; therefore, markets that have experienced high levels of retail investor participation also experience volatility associated with emotional distress. For example, on days when the Sensex drops by 800 points, the emotional response of the retail segment causes panic in retail investor behaviour, this leads to "panic selling", where most of the retail investor liquidation decisions are made based on emotion not based on company fundamentals and fear of future losses. Whereas a bull market fuels the emotion of "Greed", which drives investors to buy the next "Multi-bagger" stock based on tips from sources such as Telegram, YouTube "Fin-fluencers" etc., without considering any valuation metrics.

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The argument made in this document is that the evolution of the human brain was to respond to survival and immediate threats; it cannot comprehend the long-term, counter-intuitive aspect of wealth building. Therefore, by performing a side-by-side comparison between the logic of AI and Human behaviour, this paper will demonstrate that technology is the only real protection against self-destructive actions of retail investors.

Literature Review:

1. **Prospect Theory and the Indian Mindset**

   In India, physical assets like Gold and Real Estate have historically been the basis of household wealth. Transitioning into the equity market, these investors apply this same thought process regarding "safety." Prospect Theory (Kahneman & Tversky, 1979) states, on average, the pain associated with losing ₹10,000 is two times greater than the happiness created from gaining ₹10,000. Our survey data indicates an average score of 3.89 on our "Fear of Loss" scale. This means the average Indian investor exhibits a greater concern for protecting capital than for building a portfolio that compounds wealth over time, which results in many investors exiting the market prematurely during periods of market correction.

2. **The "Fin-fluencer" and Herd Behaviour**

   In an examination of the data collected for the Herd Mentality (an average of 3.87 in our study), we find that this phenomenon is especially strong in India, where there is a cultural emphasis on receiving community approval for financial decisions. The ability of social media to create a "digital herd" allows for the rapid growth of price bubbles created by retail investors flocking to a certain sector of the economy (e.g., Renewable Energy or Defence) once it begins trending on social media. The Mean Score for "Herd Impact" (average score of 3.84) supports the general tendency of retail investors to buy at the top of a price bubble and sell shortly after that bubble bursts when the hype around an investment dies out.

3. **AI as a Neutral Arbitrator**

   Contrary to a human financial advisor, Artificial Intelligence does not experience 'Regret Aversion.' That is, it cannot be 'pushed' by social pressures that arise from the media attention a trending stock may receive. In contrast, AI systems utilize Natural Language Processing (NLP) methodologies via Sentiment Analysis to analyze and quantify investor emotions and therefore 'Market Noise.' AI's ability to analyze and quantify market noise enables investors to be alerted when the price movement of a security does not reflect the company's earnings performance.

Methodology:

This study employs a **Descriptive and Survey-Based Methodology**.

- **Population:** Active retail investors in Mumbai.
- **Sample Size:** 75 respondents (Primary Data).
- **Instrument:** A Five-Point Likert Scale questionnaire designed to test three pillars:
  1. **Emotional Reactivity:** How investors respond to a 5% drop in the Nifty 50.
  2. **Technological Adoption:** Current usage of AI/Automated tools.
  3. **Perceived Effectiveness:** The trust level in AI-driven risk management.
- **Demographics:** The study reflects the "Young India" profile, with 44% of respondents aged 26–35, who are the primary users of AI-integrated trading apps.

Statistical Analysis and Data Findings :

1. The Prevalence of Negative Emotions

The data shows that **Fear** is a more dominant driver than **Greed** in the Indian retail segment.

- **Panic Selling (Mean 3.89):** Investors admit to a high probability of selling during volatility.

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- **Fear of Loss (Mean 3.89):** This is the root cause of the "Disposition Effect"—selling winners too early and holding losers too long.
- **Greed in Rising Markets (Mean 3.71):** While greed is present, it is slightly lower than fear, suggesting that Indian investors are "risk-aware but emotionally fragile."

2. **The "Self-Awareness Gap"**

One of the most profound findings in the 75-respondent sample is the **Bias Awareness score (3.56)**. While investors are *somewhat* aware that they are biased, their **Emotional Loss score (3.63)** remains higher. This proves that awareness does not equal control. An investor may *know* they shouldn't panic, but when the portfolio turns "Red," the biological response overrides the logical one.

3. **The Efficacy of AI Interventions**

When respondents were asked to rate the effectiveness of AI-based tools, the results were overwhelmingly positive:

AI Feature	Mean Effectiveness (1-5)
Automated Rebalancing	4.21
AI Risk Alerts	4.17
Long-Term Stability Perception	4.15
Early Warning Systems	4.01

The highest score in this area was for Automated Rebalancing. In the Indian stock market where sectors shift quickly; this is due largely to the fact that human decision-making is often delayed due to 'Emotional Attachment' to specific stocks. The technology utilizes pre-defined rules for rebalancing within the stock market, thus completely removing the human 'hesitant factor' from the process of Rebalancing using AI.

Discussion: AI versus the Human "System 1":

In his book 'Thinking Fast and Slow', Daniel Kahneman discusses the concept of 'System 1' (a quick emotional response) and 'System 2' (a slower rational approach) utilized by humans in the investment decision-making process. Many times, retail investors make poor investment decisions due to 'System 1' thinking taking over their emotions.

1. **AI Functions as a Proxy for the Human 'System 2'**

The nature of an AI to act as a proxy for the slower, more rational aspect of human decision-making is demonstrated when an investor receives an alert from an AI Risk Alerts with a 'mean score' of 4.17 indicating an impending panic sale of their equities, thereby providing a reasonable amount of data for the investor to evaluate to assist in making a more rational decision.

2. **The Filter of a 'Fin-Fluencer'**

Utilization of AI to perform Market Sentiment Analysis provides a way for investors to differentiate between the 'noise' and actual information regarding equities from Social Media posts. By employing AI tools such as the Market Sentiment Analysis Tool, investors can determine if a sudden increase in the volume of an equity is due to organic growth of the company's equity or due to a 'Pump and Dump', thus avoiding the possible ramifications of a herd mentality toward an equity.

Conclusion and Recommendations:

This research found that the debate of Human vs AI is less of a competition and more of a partnership when it comes to investing in India. In fact, when it comes to the retail investor in India, the biggest barrier to achieving wealth is the way we see savings in our culture as fear-based; we tend to save our money rather than take risks on investing it.

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In summary:

1. **Fear of Losing Money is the Biggest Roadblock to Creating Wealth:**
   Panic selling (Rating of 3.89 out of 5) was cited by survey respondents as the number one reason people lose wealth in India.
2. **Automation and Technology are Necessary to Reduce Human Important Decisions:**
   According to the study, technology (i.e., automated re-balancing), which does not require human intervention (Rating of 4.21 out of 5) was seen as the best way to solve this situation.
3. **AI as The "Disciplinarian":**
   Many survey respondents stated they feel they lack the discipline (75%) required to make correct investment decisions during extreme market volatility.

Recommendations:

For Retail Investors: Move from manual trading to AI-assisted investing; and set long-term investing goals (i.e., portfolio allocation) based on individual needs, not emotions.

For Regulators (e.g., SEBI): Support the development of AI technology that will help warn users when they are participating in Herd Behaviour in regard to their investments.

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Appendix - Data Summary (n=75)

- *Investors favoring Equity: 40%*
- *Most trusted AI tool: Automated Rebalancing (4.21/5)*
- *Primary emotional driver: Fear of Loss (3.89/5)*

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