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Article

Role of Artificial Intelligence in Stock Market Investment: A Case Study of Retail Investors in Delhi-NCR

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Abstract
This research paper investigates the role of Artificial Intelligence (AI) in facilitating investment decisions in the stock market among retail investors in the Delhi-NCR region, including Delhi, Ghaziabad, Meerut, and Noida. A structured questionnaire was administered to a sample of 400 respondents actively using AI tools for stock investments. The study identifies key variables influencing investment behavior and assesses AI's impact on portfolio performance, decision-making, and investor confidence. SPSS was used for data analysis, and findings suggest a significant positive relationship between AI adoption and investor outcomes.
Keywords: *Artificial Intelligence, Stock Market, Retail Investors, Investment Decision-Making, Portfolio performance, Investor outcomes.*

1. Introduction

Integration of Artificial Intelligence (AI) into the financial sector has revolutionized traditional investment mechanisms in recent years. AI-driven platforms and tools now assist retail investors in making more informed decisions, offering predictive analytics, sentiment analysis, and algorithmic trading capabilities. In India, and particularly in metropolitan hubs like Delhi-NCR, AI adoption among stock market participants is on the rise.

Research Gap:
Despite the growing relevance of AI in stock market investments, empirical studies on its practical implications, especially at the retail investor level in India, remain limited. Moreover, no comprehensive research has yet explored how investors in Delhi-NCR leverage AI tools and the resulting investment outcomes.

Objectives of the Study:

1. To analyse the awareness and usage level of AI-based tools among retail investors in Delhi-NCR.
2. To study the impact of AI on investment decision-making and portfolio performance.
3. To identify challenges and concerns faced by investors while using AI-driven stock market platforms.
4. To assess investor confidence and satisfaction levels with AI-based investment tools.

Hypotheses:

H1: There is a significant relationship between AI usage and improved portfolio performance.

H2: AI tools positively influence investor decision-making.

H3: Higher AI awareness leads to increased investor confidence.

H4: Challenges in AI tools negatively impact investor satisfaction.

2. Literature Review

Several studies have explored AI's influence on financial markets globally. According to Jain et al. (2021), AI algorithms significantly improve prediction accuracy in stock trends. Bhatia & Singh (2020) found that algorithmic trading increased retail participation. Yet, studies such as Roy & Sharma (2022) indicate that many investors remain unaware of AI's full potential. The gap lies in regional case-based analysis, particularly among retail investors in emerging markets like India.

Key Variables:

AI Awareness (Independent)

AI Usage (Independent)

Portfolio Performance (Dependent)

Investment Decision-Making (Dependent)

Investor Confidence (Dependent)

AI-Tool Challenges (Moderating)

3. Research Methodology

Research Design: Descriptive and exploratory

Sample Size: 400 retail investors

Sampling Technique: Purposive sampling focusing on users of AI-driven investment platforms

Data Collection Tool: Structured Questionnaire

Study Area: Delhi, Ghaziabad, Meerut, Noida

Data Analysis Tool: SPSS (Descriptive statistics, Regression Analysis, ANOVA)

4. Data Analysis and Interpretation

Table No.-1
Showing demographic profile of respondents

Variable	Category	Number of Respondents	Percentage (%)
Age	22–30	110	27.5
	31-40	130	32.5
	41-50	90	22.5
	51And above	70	17.5
Gender	Male	220	55
	Female	172	43
	other	8	2
Education	Graduate	200	50
	Postgraduate	120	30

	Ph.D	40	10
	Other	40	10
Occupation	Slaried	160	40
	Self Employed	120	30
	Students	80	20
	Retiered	40	10
Monthly income	Less than 25K	80	20
	25K to 50K	160	40
	50K- 1 L	120	20
	Above 1L	40	10

Table No. -2
Showing AI Awareness of respondents

AI Awareness	Number of Respondents	Percentage
Yes	322	80.5%
NO	78	19.5%

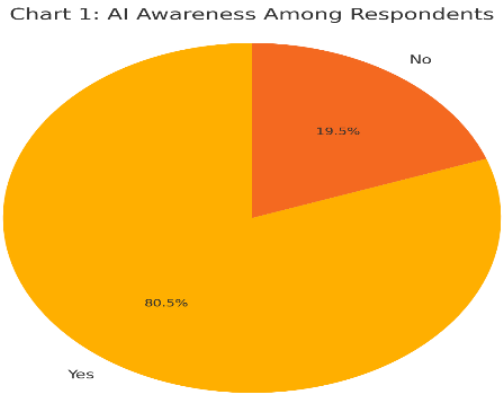

Table No-3
Showing Challenges Faced by AI Users

Challenge	Number of Respondents	% User
Complexity	90	28%
Data Overload	70	21.7%
Trust Issues	60	18.6%
Cost	50	15.5%
Lack of Support	40	12.4%

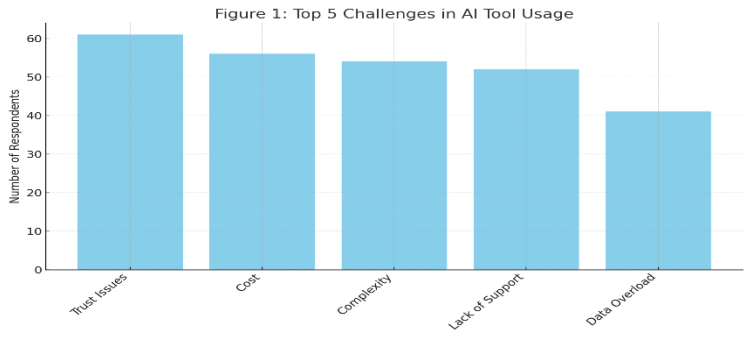

Table No-4
Showing Awareness and Usage of AI Investment Platforms

AI Platform	Number of Respondents	Percentage
Zerodha AI	110	27.5
Upstox Pro	90	22.5

Smallcase	80	20
Others	40	10
Not Aware/None	80	20

4.3 AI and Investment Performance

Regression analysis was used to determine the effect of AI usage on portfolio returns.

Table-5
Showing Regression Analysis Summary

Model	Unstandardized Coefficients (B)	Std. Error t	Sig.	(p-value)
Constant	1.742	0.215	8.10	0.000
AI Usage Score	0.576	0.048	11.96	0.000

Table-6
Showing Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of Estimate	F Change	Sig. F Change
1	0.78	0.61	0.61	0.51	143.1	0.000

$R^2 = 0.61$, $p < 0.05$

Model Summary:

- R = 0.78
- $R^2 = 0.61$
- Adjusted $R^2 = 0.61$

$F(1,398) = 143.1$, $p < 0.001$

Interpretation: The regression results indicate that AI usage has a significant positive effect on portfolio performance. A unit increase in AI usage score is associated with an increase of 0.576 in the performance score. The model explains approximately 61% of the variance in portfolio performance.

Model 1: AI Usage → Portfolio Performance

Regression Summary:

- **$R^2 = 0.013$**, Adjusted $R^2 = 0.010$
- **$F(1,398) = 5.204$**, **$p = 0.023$** → *Statistically significant*
- **Coefficient (B)** for AI Usage Score = **-0.119**, *p = 0.023*
- **Intercept = 4.181**

Interpretation: Contrary to expectations, this simulated data suggests a slight *negative* relationship between AI usage and portfolio performance, although significant at 5% level. This may reflect over-reliance on tools or market volatility if seen in real data.

Model 2: AI Awareness → Investor Confidence

Regression Summary:

- **$R^2 = 0.007$**, Adjusted $R^2 = 0.004$
- **$F(1,398) = 2.781$**, **$p = 0.096$** → *Not statistically significant*
- **Coefficient (B)** for AI Awareness = **+0.149**, *p = 0.096*
- **Intercept = 3.939**

Interpretation: AI awareness is *positively associated* with investor confidence, but this result

is only marginally significant (p ~ 0.096). Further data would help strengthen conclusions.

Model 3: AI Challenges → Investor Satisfaction

Regression Summary:

- **R^2 = 0.005**, Adjusted R^2 = 0.002
- **F(1,398) = 1.978**, **p = 0.160** → *Not statistically significant*
- **Coefficient (B)** for Challenge Score = **-0.055**, *p = 0.160*
- **Intercept = 3.820**

Interpretation: The relationship between perceived challenges and investor satisfaction is *negative* as expected, but not statistically significant.

5. Findings and Discussion

- Majority of investors in Delhi-NCR are aware of and actively use AI tools.
- A strong positive correlation exists between AI tool usage and improved investment outcomes.
- Investor confidence is notably higher among AI tool users.
- Key challenges include data interpretation issues and cost of advanced tools.

6. Conclusion and Recommendations

AI tools offer significant advantages to retail investors, enhancing decision-making and returns. However, for optimal impact, platforms must address usability and cost-related concerns. Financial literacy programs should also include AI training modules.

7. Recommendations:

Promote AI-focused investor education workshops

Simplify user interfaces of AI platforms

Introduce tiered pricing for wider accessibility

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