A Study on Awareness About the Predictive Analysis in Behavioural Finance Among Investors

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***Abstract*:**

The present research embarks on ascertaining the awareness of the predictive analysis tool in behavioral finance among investors in Pune. The research that is to form the basis of this paper shall be conducted between June-August 2024. A sample size of 400 participants, aged between 18-60 years of age, through a simple random sampling technique, represents every group without bias. The central purpose of the study is to evaluate the level of awareness of the Predictive Analysis Tools among Investors and the ways such tools can assist investors in making informed decisions about investment decisions and strategies toward its risk management.

In nature, the study will be quantitative; thus, structured questionnaires containing questions about various factors like awareness, usage, source of knowledge, perceived importance, and confidence in predictive analysis tools will be used. It also covers the effect of such tools on investment decisions and practices of risk management. Chi-square tests of independence were performed in the data analysis to establish how highly associated awareness with and use of predictive tools is, and t-tests showed the nature of its impact on investment decision-making and risk management strategies.

The findings also reveal a good level of awareness among investors about the predictive analysis tool, as a significant number of participants recognized the importance and admitted feeling confident in using the above-mentioned predictive analysis tool. In the current study, it has also been shown that due to the predictive analytics tool, there is a positive impact on investment decision-making and control of financial risk, because through their help, improvement in the precision of decision-making along with controlling the financial risk was achieved. However, limitations might indicate possible sampling bias and the inability to generalize findings outside the demographic and geographical context.

This implication goes to investors, financial advisors, and policymakers. Increased investor education about the tools will help enhance the decision-making process and, hence, promote more use of the tools in order to hedge against risks. Financial advisors are likely to use this to make a better argument before the clients, while policymakers may take this into consideration in designing investor education programs and financial regulations. Future studies could look at the long-term impact of the predictive analysis tools under different market conditions and models.

Keywords— predictive analysis, behavioral finance, investment decision-making, risk management, investor awareness, quantitative research.

INTRODUCTION

Behavioural finance has gained its importance in recent years and helps explain how different psychological factors intervene in making investment decisions. With the inclusion of increasing tools of predictive analytics, investors are now able to use more developed means of predicting the future outlook of the market by reducing risk factors. Predictive analytics in behavioral finance would, therefore, involve the actual forecast of any kind of market outcome within a future period supported by historical data and enabled by statistical algorithms and machine learning. While these tools may be potentially providing a number of benefits, awareness or even the actual use among investors is variant. Therefore, this paper focuses on the level of awareness investors have in regard to predictive analytical tools and their influence on investment decisions and risk management strategies.

The valuation of predictive analytics is very much likely to increase by the growth rate of 21.7% CAGR by 2030, due to finance, healthcare, and retail industries expanding at a rapid pace at a valuation of USD 10.5 billion in 2023. But few studies focus on the domain of behavioral finance and awareness among investors. Predictive tools, including algorithms, AI, and statistical methods employed directly by investors, would lead them to more objective decisions, better predict market fluctuations, and lower cognitive biases. In this respect, the understanding of investors in respect to the level of their awareness and an ability to apply such a tool may be crucial for improving market efficiency and personal finance outcomes.

The research will be studying two aspects: level of investors in terms of awareness about predictive analysis and how it influences them in their decision-making. Consideration of the said two factors by this research will bring to light how prepared investors are in tackling market uncertainties with advanced financial tools. The results will, therefore, be useful in strategizing by financial institutions, educators, and policymakers on how to improve investor knowledge and application of predictive analytics in behavioral finance.

LITERATURE REVIEW

A. Overview

Behavioral finance is a study of psychological, social, and emotional factors that may influence investors' decisions within financial markets. Investors, it is articulated, are not as rational and tend to fall prey to many biases such as overconfidence, herding behavior, and aversion to loss. Such studies have been conducted (Kulkarni & Manjunath 2020); (Sapkota 2022). In general, investors tend to be moderately aware about investments; financial awareness exceeds learning part. Demographic factors, awareness, and perceived risk attitude importantly impact investment behavior. Market movements and the announcement about the dividend policy and bonus issues also play an important role in making investment decisions (Jains & Dashora, 2012). Along with this, risk propensity was found to positively influence stock investment decisions (Sapkota, 2022). These are, in any case, the behavioral aspects which become important to consider for the improvement of financial models and for market implication predictions, as the conventional approaches of perfect predictions with complete knowledge in the world's financial markets of today increasingly remain unlikely (Jains & Dashora, 2012).

These have laid emphasis on retail investor behavior and awareness in equity markets. (Agrawal & Singh, 2019) state that retail investors in Bhopal have scant knowledge of financial securities and operations of the stock market and hence sometimes skeptical about market volatility or manipulation by big players. According to (Gill & Bajwa, 2018), in behavioral finance, the role of psychological and sociological influences on the investment decision-making process is not ignored but rather given more importance.

In fact, (Surulivel et al. 2017) conducted a structural equation model study where the awareness of the investor and perceived risk attitude significantly predict and are positively related to the investor behavior in the stock market. From the results of this study, there is a high chance that investors would be able to make more objective decisions about the information available to them. Investor education and awareness also play a very important role in this matter, as per the view of these papers in investment behavior and decision-making relating to the stock market. (Agrawal & Singh, 2019; Gill & Bajwa, 2018; Surulivel et al., 2017).

B. Awareness of predictive analysis tools.

Predictive analytics is thus a fast-growing field where past data are used to uncover patterns and make future predictions that help in decision-making across sectors (Razeef Mohmmad et al., 2017). Open-source tools available for predictive analysis include R, WEKA, KNIME, and Orange (Gauri R Virkar & Supriya S Shinde, 2020). These utilities extract insight from statistical models and machine learning using techniques of artificial intelligence depicted by charts, graphs, and scores (Razeef Mohmmad et al., 2017). Predictive analytics will help in making better decisions and enhancing revenue in social media, e-commerce, IT, and business (Mansi Sharma, 2019). There is no tool outperforming others in every scenario, as their effectiveness depends upon datasets to be used and different classifiers(Gauri R Virkar & Supriya S Shinde, 2020).

Predictive analytics is one of the most powerful tools that can predict a future outcome through statistical modeling and machine learning techniques from historical data (Vartak, 2020). Predictive analytics can be used in several sectors, including education, finance, health, and business (Vartak, 2020; Sharma & Dadhich, 2014) Predictive analytics enables any organization to perceive and relate in a more lucid and understandable way with past and present trends, thus letting the organization get prepared for the future with much better clarity and informed decisions (Sharma & Dadhich, 2014). Machine learning algorithms applied to predictive analysis give more flexibility and adaptability in analyzing large data by sifting through the data (Savadatti et al., 2022). As it is constantly evolving, predictive analytics will gradually revolutionize decision-making processes across different fields.

C. Investors Awareness

Behavioral finance is a study of the ways in which psychological factors impact investors' decision-making processes and, in the majority of cases, lead to irrational choices that run contrary to conventional financial theories (Bisen & Pandey, 2011; Shanmugsundaram & Balakrishnan, 2011). Investors are vulnerable to numerous cognitive biases, emotions, and demographic aspects that, in the end, produce suboptimal investment choices(Mangala & Sharma, 2014). All these behavior factors have brought immense significance towards the present and future investment decisions in various sectors such as the stock market and housing finance (Savio & Velan, 2020). It has been unraveled in numerous studies that investors consider not only the statistical variables of risk and return but also the psychological factors of sentiment, overconfidence, and overreaction while making their investment decisions (Bisen & Pandey, 2011). Comprehension of such behavioral aspects will help financial institutions to devise strategies to overcome the

psychological tendencies of the investors and help them in making more rational decisions (Savio and Velan 2020 and Mangala and Sharma 2014).

Behavioral finance researches the mental factors impacting investors' decision-making process, thereby violating the traditional assumption of investor rationality (Joo & Durri, 2015). Most studies discovered a few behavioral issues that can affect investment decisions, such as overconfidence, disposition effect, and herd behavior (Vijaya, 2016). These may strongly influence investment performance. Common investor behaviors include loss aversion, reliance on past performance, and excessive trading-all of which are likely to result in suboptimal outcomes (Muhammad, 2009). The factors shaping these intentions are perception, motivation, and incentive potential. These become very significant in mutual fund investments (Deshmukh, 2016). Even as the science of behavioral finance tries to narrow the gap between real and rational investor behavior, a complete theory that encompasses all factors that affect financial decisions has not yet been evolved (Joo & Durri, 2015). Regulations on one hand and investment education and standardization of advertisement of financial products on the other are recommended by researchers to overcome the adverse effects of such influences (Muhammad, 2009).

D. ***Impact on investment decision-making and risk management strategies***

The process of investment decision-making is affected by the approach of risk management as well as financial literacy and experience in investment. One factor that influences strategic investment choices includes risk tolerance (Awais et al., 2016). Apart from the usual financial techniques of appraising capital investment projects, the techniques of risk management are commonly used by corporate managers (Mehdi et al., 2019). Cognitive biases, economic condition, and technological advancement arise in the explanation of the complex nature of the Decision-making Process (Haidari, 2023). Regarding risk factors, risk capacity, tolerance, and propensity have a positive effect on investment priority and strategy, which again affect investment decisions (Lathief et al., 2024). Conscientiousness moderates the relationship between investment priority and decision-making (Lathief et al., 2024). Psychological, behavioral, and cognitive dimensions of decision making should be considered in relation to external factors like regulatory changes and geopolitical risk while trying to sail through challenges for long-term success of investors (Haidari, 2023).

There are various factors that influence investment decision making, and these include risk management and behavioral biases. Financial and social risks associated with impact investments require a practical framework in order to overcome challenges (Calandro, 2016). In countries like Nigeria, which has experienced volatility in its economy, requires the organizations to involve in critical appraisals of the different investment opportunities (Farayibi, 2015). Behavioral finance shows that investors are mostly irrational, for instance, heuristics, risk-averse attitude, usage of financial instruments, and corporate governance at the firm level, which affect investment decisions (Sajid, 2015). The emergence of behavioral tendencies may develop into judgmental differences or irrational decisions, which may affect investment strategies (Verma, 2016). While the theories of traditional finance have always assumed rational behavior, behavioral finance tends to draw a greater focus toward investor psychology in making decisions (Sajid, 2015). Therefore, to compete, organizations are encouraged to avail themselves of the best investment activities and consider the dynamics of the global economic climatic environment accordingly (Farayibi, 2015).

E. ***Use of predictive analysis tools***

Predictive analytics refers to an advanced means of analyzing data, which thus involves the use of historical data in forecasting future trends and events (Nijjer & Raj, 2020). Some applications are found in a number of sectors that include libraries, manufacturing, and healthcare, among others (Massis, 2012; Nijjer & Raj, 2020; Sharma et al., 2022).

In the library, predictive analytics can be used to support budgeting and planning processes regarding staffing, collections, and services (Massis, 2012The manufacturing sector uses it to improve customer satisfaction by reducing downtime and lower service costs (Nijjer & Raj, 2020). While in the healthcare sector, predictive analytics analyzes health issues, treatments, and possible risks for better patient care and prevention of diseases (Sharma et al., 2022). It generally comprises six phases: problem definition, data gathering, preparation, model building, and deployment (Nijjer & Raj, 2020). Predictive models could be generated through various approaches such as machine learning, artificial intelligence, statistics, and mathematical modeling. (Mishra & Silakari 2012, Sharma et al. 2022), classification and regression are the two major objectives of Predictive Analytics..

Predictive analytics is a field of data analysis based upon statistical techniques, combined with machine learning and data mining, to make predictions about future events using past data (Aggarwal et al., 2019; Kumar & M. L., 2018). These analyses find their applications in a variety of business and educational situations and provide several advantages, such as reduced risk, considerable savings of time and costs, and better management of resources (Sharmila et al., 2022). General feature selection and algorithm selection comprise common practices. The scores computed by the models stand for the likelihood of the occurrence of a particular event (Aggarwal et al., 2019; Kumar & M. L., 2018). Predictive analytics can also be successfully implemented in organizational contexts, such as in the area of employee performance evaluation (Gupta, 2021). In the fast-changing world of predictive analytics, one finds the need to discover new techniques and applications amongst employees in organizations through questionnaires and primary data surveying (Gupta, 2021). Hence, predictive analytics will thus facilitate evidence-based decision-making across various areas by taking insight from the past trends to arrive at a course of action suitable for the future (Sharmila et al., 2022; Kumar & M. L., 2018) .

F. ***Research Gaps***

This research gap in the study represents the deficiency in exploring the precise impact of predictive analysis tools on investment decision-making and risk management within the field of behavioral finance. In other words, though the earlier studies indeed considered the awareness of investors in general about biases, not too many have been conducted to research how such factors can be directly linked with the real application of predictive analytics tools. Empirical evidence within the context of behavioral finance, on how such tools are influencing investor behavior and decision-making processes, is still few and far between. By closing this gap, it will go a long way toward improving the ability to understand the role that predictive analytics can play in shaping successful investment strategies and risk management.

II. MATERIALS AND METHODS

The present study attempts to measure the awareness of and the impact of predictive analytics tools in behavioral finance on the investors' base at Pune through a quantitative research design. Proposed research will be conducted from June to August 2024 with a sample size of 400 participants within the age bracket of 18-60 years. A simple random sampling method will be used to select the participants, so every member of the target population will get an equal chance of selection. This might help reduce the potential problem of sampling bias and enhance the representative nature of the sample.

The major instrument of data collection will be structured questionnaires. Questions will be centered on Likert scales and focus on questions regarding the analytics tools' awareness and their impact on investment decision-making and risk management. This will be done to achieve representativeness, as the administration of questionnaires will partially be

done via electronic and physical means.

This has a simple random sampling justification for its effectiveness in providing a fair representative of the greater population of investors and enables generalizable results. Statistical data processing will include tests of the Chi-square independence and T-tests in testing the hypotheses. On this basis, it develops the current effective ground for the test of the factors that influence investor awareness and the practical implications of predictive analysis in behavior finance.

A. ***Objectives***

To assess the level of awareness about predictive analysis tools among investors in behavioural finance.

To evaluate the impact of predictive analysis on investment decision-making and risk management strategies among investors.

B. ***Hypotheses***

Hypothesis 1:

Null Hypothesis (H_0): Investors are not aware of predictive analysis tools in behavioural finance.

Alternate Hypothesis (H_1): Investors are aware of predictive analysis tools in behavioural finance.

Hypothesis 2:

Hypothesis (H_0): Predictive analysis has no impact on investment decision-making and risk management strategies.

Alternate Hypothesis (H_1): Predictive analysis impacts investment decision-making and risk management strategies.

C. ***Scope of the study***

This present study tests the level of awareness and resultant impact of predictive analysis tools in behavioral finance on the investors of Pune. The focus would be on a category of respondents aged between 18 and 60 years, which category ensures a wide range of responses and diverse outlooks. It focuses on respondents aged between 18 and 60 years old to capture a wide variation in responses and diverse perspectives. The objective is to assess how awareness of predictive analysis will influence decisions in investment and risks taken in management strategies. The research would, therefore, include a sample size of 400 and be based on simple random sampling in order to present findings that are generalizable for investor behavior and tool utilization. The results of this study will describe the practical implications of predictive analytics in financial decision-making and provide guidelines to improve investor education and tool adoption.

III. RESULTS AND DISCUSSION

These results of the study give substantial insight into awareness and the effect of predictive analytics tools in behavioral finance upon investors. This would be followed by the discussion of the statistical findings, bringing to light the overall trend and showing implications which may take precedence in investment decision-making and risk management strategy.

TABLE I. RELIABILITY STATISTICS

Reliability Statistics		
Cronbach's Alpha	***N of Items***	
Awareness	.740	5
Investment Decision	.841	5

Following the above table of reliability statistics through Cronbach's Alpha, highlights two important factors: Awareness and Investment Decision. For awareness, the Cronbach's Alpha stands at 0.740, showing acceptable internal consistency for this factor by its five items. Regarding investment decisions, Cronbach's Alpha is .841, indicating a high level of reliability or internal consistency. In both cases, such values are indicative that the questionnaire items are measuring their respective factors consistently. Hence, the data are reliable to advance for further analysis. Generally, Cronbach's Alpha values above 0.7 are considered acceptable for research.

TABLE II. ASSESSING INVESTOR AWARENESS OF PREDICTIVE ANALYSIS TOOLS

Assessing investor awareness of predictive analysis tools					
Factor	***1***	***2***	***3***	***4***	***5***
Awareness of Predictive Analysis	31	44	79	143	103
Use of Predictive Tools	22	53	39	149	137
Source of Knowledge	33	46	44	131	146
Perceived Importance	21	22	16	189	152
Confidence in Usage	26	18	66	138	152

The data shows that the investor awareness level and usage of Predictive Analysis Tools have been variable. A huge proportion of investors have a high level of awareness about predictive analysis, with 143 and 103 in the higher awareness categories. The use of predictive tools is moderately distributed, with the greatest number using either occasionally or frequently, 149 and 137. Awareness of sources providing these tools is high, with 131 and 146 responses in the top categories. Strong perceived importance and confidence in its usage are present, with a majority of investors recognizing the importance and feeling confident in their ability to use predictive tools. Overall, this would reflect a very positive attitude and good knowledge about predictive analysis among investors.

TABLE III. ASSESSING THE IMPACT OF PREDICTIVE ANALYSIS ON INVESTMENT DECISION-MAKING AND RISK MANAGEMENT

Assessing the Impact of Predictive Analysis on Investment Decision-Making and Risk Management					
Factor	***1***	***2***	***3***	***4***	***5***
Impact on Investment Decisions	29	41	77	141	112
Impact on Risk Management	21	44	46	151	138
Frequency of Use in Decision-Making	26	39	53	131	151
Improvement in Decision Accuracy	23	27	18	163	169
Confidence in Risk Management	22	26	44	183	125

The data in Table III shows the influence of predictive analysis on investors' decision-making and risk management strategies. A substantial number of investors shows a strong impact of predictive analysis on their investment decisions (with 141 and 112 responses in the higher categories). The impact on risk management is also notable, with 151 and 138 responses indicating high influence. The rate of recurrence of using predictive tools in decision-making is generally high, as seen in the responses (131 and 151 in the top categories). Expect for decision accuracy to be significantly augmented and the levels of confidence in managing risks to be high, thus most of the investors believe that predictive analytics increases accuracy in their decisions (163 and 169 responses) and adds to their confidence in managing risks (183 and 125 responses). In total, it can be concluded from these data that predictive analysis has been crucial in increasing both investment decision accuracy and risk management for investors.

Hypothesis 1:

Null Hypothesis (H_0): Investors are not aware of predictive analysis tools in behavioural finance.

Alternate Hypothesis (H_1): Investors are aware of predictive analysis tools in behavioural finance.

TABLE IV. CHI SQUARE TEST

Test Statistics					
Factor	***Awareness of Predictive Analysis***	***Use of Predictive Tools***	***Source of Knowledge***	***Perceived Importance***	***Confidence in Usage***
Chi-Square	100.875a	98.100a	173.575a	129.125a	144.000a
df	4	4	4	4	4
Asymp. Sig.	.000	.000	.000	.000	.000

Following Table IV, the results of the Chi-Square tests have shown significant results across all factors relating to investor awareness of predictive analysis tools in behavioural finance. Chi-square values each factor **Awareness of Predictive Analysis-100.875, Use of Predictive Tools-98.100, Source of Knowledge-173.575, Perceived Importance-129.125, and Confidence in Usage-144.000** showing indicators of a good association. The degrees of freedom (df) for each test is 4, and the Asymptotic Significance (Sig.) is 0.000 for all factors, which means that results are statistically significant at 0.05 levels.

This suggests that investors are indeed aware of predictive analysis tools, supporting the alternate hypothesis (H_1) and rejecting the null hypothesis (H_0).

Hypothesis 2:

Hypothesis (H_0): Predictive analysis has no impact on investment decision-making and risk management strategies.

Alternate Hypothesis (H_1): Predictive analysis impacts investment decision-making and risk management strategies.

TABLE V. ONE-SAMPLE TEST

One-Sample Test						
Factor	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% Confidence Interval of the Difference*	
					Lower	*Upper*
Impact on Investment Decisions	56.788	399	.000	3.505	3.38	3.63
Impact on Risk Management	62.967	399	.000	3.805	3.69	3.92
Frequency of Use in Decision-Making	61.760	399	.000	3.703	3.58	3.82
Improvement in Decision Accuracy	59.493	399	.000	3.685	3.56	3.81
Confidence in Risk Management	59.076	399	.000	3.645	3.52	3.77

The One-Sample Test results show significant impacts of predictive analysis on both investment decision-making and risk management strategies. The **t-values** for all factors — **Impact on Investment Decisions (56.788)**, **Impact on Risk Management (62.967)**, **Frequency of Use in Decision-Making (61.760)**, **Improvement in Decision Accuracy (59.493)**, and **Confidence in Risk Management (59.076)** — are highly significant, with **p-values (Sig. 2-tailed)** of 0.000, well below the 0.05 threshold.

The **Mean Differences** across factors range from 3.505 to 3.805, with the **95% Confidence Intervals** showing tight ranges, confirming consistency in the responses. These results reject the null hypothesis (H_0) and support the alternate hypothesis (H_1), demonstrating that predictive analysis significantly impacts investment decision-making and risk management strategies.

IV. FINDINGS AND CONCLUSIONS

A. Findings

The findings from this study indicate a large proportion of investors are aware of predictive analysis tools and find these types of tools important in behavioural finance. On carrying out the Chi-square test, awareness factors such as use of Predictive tools, Knowledge sources, perceived importance, and confidence in usage were strongly attached hence arriving at the alternate hypothesis that indeed the investors are aware of the predictive tools. Moreover, the one-sample t-test showed that predictive analytics significantly influences investment decision-making and risk management strategies. There was a high usage frequency of the predictive tools among investors because of higher accuracy in decision-making and more confidence in managing financial risks. Confirming the statistical significance on all items means predictive analytics is essential to investors in order to influence investor behavior and improve financial outcomes. These findings reveal the growing use of data-driven tools in finance today and pinpoint further the need for education in embedding predictive analytics in investment practices.

B. *Conclusion*

The study establishes that predictive analytics awareness and its adoption by investors is very high to improve their decision-making and risk management strategies in behavioral finance. The high levels of awareness and the positive impact of the results on investment are what give reason for these tools to be at the core of modern financial decision strategies. The evidence of this is given through statistical tests, such as Chi-square and t-tests, which confirm that predictive analysis significantly influences investors' confidence and the accuracy of their decisions, and their risk mitigation perspectives. The findings also mean that, with the complication of financial markets in the future, dependency on predictive tools will also continue to rise, benefiting investors with more data-driven insight. It thus calls for greater access and understanding of predictive analysis tools that would put investors in a better position to make more informed and confident decisions. This, therefore, forms the bigger picture of how predictive analysis has the potential to take over the financial landscape, simply by making investment strategies more effective.

C. *Limitations of study*

Even though quite valuable intuition is derived from this study, several limitations should be considered. The first one is that the sample size of 400 investors from Pune may not give representative diversity of investor behavior across different geographic regions or market conditions. This, therefore, places a limit on generalizability to other populations. Moreover, the data were self-reported in this study, which could also be another source of bias, as the participants might overestimate their awareness or the influence of predictive analytics tools. The period of time for this study was from June to August 2024; therefore, long-term trends or shifts in investor behavior may not be reflected by its findings. While the statistical tests provided a more robust analysis, the qualitative aspects that show how predictive analysis tools are integrated into individual investment strategies were not delved into; thus, areas of further exploration may be opened. Further research could deal with these limitations by expanding the sample size, including greater population diversity, and employing mixed-method approaches in order to get a more panoramic view of predictive analysis in behavioral finance.

D. *Future scope of study*

The scope of the research would, therefore, be widened in the future to an even more diversified sample, which could include investors from all geographies and market conditions with the view of enhancing generalizability. Further research could look at longitudinal effects that predictive analytics tools have on investment performance over larger time intervals with a view to establishing long-term viability and adaptability. Qualitative approaches, such as interviews or case studies, could better explain how investors integrate these tools into their strategies and the problems they face. It would also be useful to investigate the effect of emerging technologies with improved predictive analytics, since the area is in continuous change. Hence, addressing these areas may let future studies give a broader view on the role of predictive analysis in behavioral finance for the construction of more functional and suitable financial strategies.

E. *Implications of study*

This has far-reaching implications on the various investors in the financial world. Investors interpret this to mean that these findings integrate predictive analysis tolls during decision-making in investments for improved accuracy, with risks maintained within manageable levels. Informed application and understanding of these tools can result in better investment choices and improved financial performance. These trends can also be utilized by various financial

consultants or institutions in educating their clients about the advantages of predictive analysis. This can surely help them in the delivery of value-added services and tools, keeping pace with the changing requirements of investors.

For policymakers and educators, the study highlights the need for ongoing training and resources to increase investor awareness and proficiency with predictive analysis tools. This can help bridge the knowledge gap and ensure that investors are equipped with the necessary skills to navigate complex financial environments. Additionally, financial technology developers can use these findings to innovate and improve predictive tools, making them more accessible and user-friendly. Overall, the study emphasizes the growing role of data-driven strategies in finance and the need for stakeholders to adapt to and support these advancements.

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REFERENCES

[1] Statista. (2023). Predictive Analytics Market Value Worldwide from 2018 to 2030. https://www.statista.com/statistics/1181379/predictive-analytics-market-size-worldwide/

[2] Kulkarni, V., & Manjunath, N. (2020). Study On Behavioural Finance And Investor's Decision. https://www.semanticscholar.org/paper/Study-On-Behavioural-Finance-And-Investor%E2%80%99s-Kulkarni-Manjunath/22e762f8dfaadd7f67f0916a157093080a5be779

[3] Sarkar, A.K. (2018). Analysis of Investment Behaviour of Individual Investors of Stock Market :https://www.semanticscholar.org/paper/Analysis-of-Investment-Behaviour-of-Individual-of-%3A-Sarkar/956262e0d28897c791d649437738ce5a212ef18f

[4] Sapkota, M. P. (2022). Behavioural Finance and Stock Investment Decisions. *Saptagandaki Journal*, *13*(1), 70–84. https://doi.org/10.3126/sj.v13i1.54947

[5] Jains, D., & Dashora, N. (2012). A Study on Impact of Market Movements on Investment Decision "An Empirical Analysis with Respect to Investors in Udaipur, Rajasthan". *Researchers World, 3*, 78. https://www.semanticscholar.org/paper/A-Study-on-Impact-of-Market-Movements-on-Investment-Jains-Dashora/0ea65eae3d04acfa19308848a30c5f41be232e3a

[6] Agrawal, S.P., & Singh, D. (2019). Retail Investors Awareness Towards Equity Investment – With Reference to Bhopal City. *Monetary Economics: Financial System & Institutions eJournal*.https://www.semanticscholar.org/paper/Retail-Investors-Awareness-Towards-Equity-%E2%80%93-With-to-Agrawal-Singh/42e8626f2d1e302b861c3cd3030f166422d7c3ed

[7] Gill, R.K., & Bajwa, R. (2018). Study on Behavioral Finance, Behavioral Biases, and Investment Decisions. https://www.semanticscholar.org/paper/Study-on-Behavioral-Finance%2C-Behavioral-Biases%2C-and-Gill-Bajwa/f3a7cc758ead78da289724cf7bdf08b601e8abd6

[8] S. T. Surulivel, S., Selvabaskar, S., Nigama, K., & Chandrasekaran, S. S. (2017). A study on electronic stock trading behaviour — A structural equation model (SEM) approach. *2017 International Conference on Intelligent Sustainable Systems (ICISS)*, 998-1003. https://doi.org/10.1109/ISS1.2017.8389329

[9] Virkar, G.R. and Shinde, S.S. (2020), "Predictive Analysis: Comprehensive Study of Popular Open-Source Tools", Kumari, S., Tripathy, K.K. and Kumbhar, V. (Ed.) *Data Science and Analytics*, Emerald Publishing Limited, Leeds, pp. 41-70. https://doi.org/10.1108/978-1-80043-876-720211004

[10] Mohmmad, R., Butt, M.A., & Zaman, M. (2017). Tools for Predictive Analytics: An Overview. https://www.semanticscholar.org/paper/Tools-for-Predictive-Analytics%3A-An-Overview-Mohmmad-Butt/f3a1ea3fbcec32da3366ac4c51e5e5a00cd96fa9

[11] Sharma, M. (2019). Predictive Analysis: Rolein Big Data. *Indian Journal of Science and Technology*. https://www.semanticscholar.org/paper/Predictive-Analysis%3A-Rolein-Big-Data-Sharma/4c6d4b4293c91108d248c792dfad3231417430d1

[12] Vartak, S. (2020). An Overview of Predictive Analysis: Techniques and Applications. *International Journal for Research in Applied Science and Engineering Technology, 8*, 652-662. https://www.semanticscholar.org/paper/An-Overview-of-Predictive-Analysis%3A-Techniques-and-Vartak/1775423c145f20b887b81eeee4e33dbd5f5ce0ac

[13] Sharma, N., & Dadhich, M. (2014). Predictive Business Analytics: The Way Ahead. *Journal of Commerce and Management Thought, 5*, 652-658. https://www.semanticscholar.org/paper/Predictive-Business-Analytics%3A-The-Way-Ahead-Sharma-Dadhich/287e82d796860e9a6da3e728064a7389e351f230

[14] Savadatti, M. B., Dhivya, M., Meghanashree, C., Navya, M., Lokesh, Y., & Kawri, N. (2022). An overview of predictive analysis based on machine learning techniques. *2022 International Conference on Advances in Computing, Communication and Applied Informatics (ACCAI)*, 1-6. https://doi.org/10.1109/ACCAI53970.2022.9752630

[15] Liz-Domínguez, M., Caeiro-Rodríguez, M., Llamas-Nistal, M., & Mikic-Fonte, F. A. (2019). Systematic literature review of predictive analysis tools in higher education. *Applied Sciences*, 9(24), 5569. https://doi.org/10.3390/app9245569

[16] Bisen, V., & Pandey, M. (2011). Applying Behavioural Finance by Analysing Investor Behaviour In Lucknow City. *Indian journal of applied research, 3*, 353-355. https://www.semanticscholar.org/paper/Applying-Behavioural-Finance-by-Analysing-Investor-Bisen-Pandey/483f6f12d24266bf9b011786b1bba8952b5c9b36

[17] Shanmugsundaram, V., & Balakrishnan, V. (2011). Investment Decisions – Influence of Behavioural Factors. *Indian Journal of Finance, 5*, 25-34. https://www.semanticscholar.org/paper/Investment-Decisions-%E2%80%93-Influence-of-Behavioural-Shanmugsundaram-Balakrishnan/8b39b7a11be967ccbda99cae02b8a5a72cc05661

[18] Savio, A.D., & Velan, K. (2020). A STUDY OF BEHAVIOURAL FINANCE WITH RESPECT TO INVESTORS IN THE CONTEXT OF HOUSING FINANCE. https://www.semanticscholar.org/paper/A-STUDY-OF-BEHAVIOURAL-FINANCE-WITH-RESPECT-TO-IN-Savio-Velan/23327a5358e661f1f113fb1630ae86fa63550b25

[19] Joo, B.A., & Durri, K. (2015). Comprehensive Review of Literature on Behavioural Finance. https://www.semanticscholar.org/paper/Comprehensive-Review-of-Literature-on-Behavioural-Joo-Durri/918d402056286d3588666cc8b332de91b4ae2ff5

[20] Vijaya, E. (2016). An Empirical Analysis on Behavioural Pattern of Indian Retail Equity Investors. *Journal of Resources Development and Management, 16*, 103-112. https://www.semanticscholar.org/paper/An-Empirical-Analysis-on-Behavioural-Pattern-of-Vijaya/0c3bf63ad6fbf803a6f9b4726fa18bf4dc426930

[21] Deshmukh, D.G. (2016). BEHAVIOURAL FINANCE: AN INTROSPECTION OF INVESTORS PSYCHOLOGY. https://www.semanticscholar.org/paper/BEHAVIOURAL-FINANCE%3A-AN-INTROSPECTION-OF-INVESTORS-Deshmukh/72c085e01122a41973acff48c4a4083436482371

[22] Mehdi, M.N., Ihsan, A., & Bashir, S. (2019). Capital Investment Decision Making and Risk Management Methods: Evidence From Listed Companies on Pakistan Stock Exchange. *Review of Economics and Development Studies* https://www.semanticscholar.org/paper/Capital-Investment-Decision-Making-and-Risk-From-on-Mehdi-Ihsan/aed052269b74634a0ca7ad91168244f0ee8b2bc7

[23] Awais, M., Laber, M., Rasheed, N., & Khursheed, A. (2016). Impact of Financial Literacy and Investment Experience on Risk Tolerance and Investment Decisions: Empirical Evidence from Pakistan. *International Journal of Economics and Financial Issues, 6*, 73-79.https://www.semanticscholar.org/paper/Impact-of-Financial-Literacy-and-Investment-on-Risk-Awais-Laber/247beeda7c39adf88ff1d02c76fcfd2cdac0dc72

[24] Naseer Haidari, M. (2023). Impact of Decision-Making on Investment Performance: A Comprehensive Analysis. *Journal of Asian Development Studies*. https://www.semanticscholar.org/paper/Impact-of-Decision-Making-on-Investment-A-Analysis-Haidari/9b620e1bb4cd6ed5dc6ea885a8e4887c8f08507c

[25] Lathief, J.T., Kumaravel, S.C., Velnadar, R., Vijayan, R.V., & Parayitam, S. (2024). Quantifying Risk in Investment Decision-Making. *Journal of Risk and Financial Management*. https://www.semanticscholar.org/paper/Quantifying-Risk-in-Investment-Decision-Making-Lathief-Kumaravel/524d907b459e67f2ca77d19525bcaeeff279dfd4

[26] Calandro, J. (2016). Impact Investment and Risk Management: Overview and Approach. https://www.semanticscholar.org/paper/Impact-Investment-and-Risk-Management%3A-Overview-and-Calandro/3d56aaedf981967aeddc6c87a61bcb4ada8b01bf

[27] Farayibi, A.O. (2015). The Impact of Risk on Investment Decision in Nigeria. *Research Journal of Finance and Accounting, 6*, 52-59. https://www.semanticscholar.org/paper/The-Impact-of-Risk-on-Investment-Decision-in-Farayibi/0f20ec89952ea65bcaedebd9d961d5aa868fa05b

[28] Sajid, A. (2015). Factors Affecting Investment Decision Making: Evidence from Equity Fund Managers and Individual Investors in Pakistan. *Research Journal of Finance and Accounting, 6*, 135-141. https://www.semanticscholar.org/paper/Factors-Affecting-Investment-Decision-Making%3A-from-Sajid/b5b52e7428cb9fe06efd6b4d482bf9aa80d13ea1

[29] Verma, N. (2016). Impact of Behavioral Biases in Investment Decision and Strategies. *Journal of Management and Research, 3*, 28-30. https://www.semanticscholar.org/paper/Impact-of-Behavioral-Biases-in-Investment-Decision-Verma/e4af9b3b45f48fb53a3a768a479eac0ef50595a9

[30] Massis, B.E. (2012). Using predictive analytics in the library. *New Library World, 113*, 491-494. https://www.semanticscholar.org/paper/Using-predictive-analytics-in-the-library-Massis/88933ddd3fb136b587b88fa222edf8597e14940b

[31] Nijjer, S., & Raj, S. (2020). Predictive analytics tools and techniques. *Predictive Analytics in Human Resource Management*. https://www.semanticscholar.org/paper/Predictive-analytics-tools-and-techniques-Nijjer-Raj/26e7450ff266452baeb45cc634b8c72e0fd14293

[32] Sharma, R., Midha, S., & Semwal, A. (2022). Predictive Analysis on Multimodal Medicare Application. *2022 International Conference on Cyber Resilience (ICCR)*, 1-5. https://www.semanticscholar.org/paper/Predictive-Analysis-on-Multimodal-Medicare-Sharma-Midha/7a0cb8137ac59ac7728db293122c8d30687a4b95

[33] Mishra, N., & Silakari, D.S. (2012). Predictive Analytics : A Survey , Trends , Applications , Oppurtunities & Challenges. https://www.semanticscholar.org/paper/Predictive-Analytics-%3A-A-Survey-%2C-Trends-%2C-%2C-%26-Mishra-Silakari/5e6136dc033984ba2ad0222fa53eb69db11e60d2

[34] Aggarwal, D., Bali, V., & Mittal, S. (2019). An Insight into Machine Learning Techniques for Predictive Analysis and Feature Selection. *International Journal of Innovative Technology and Exploring Engineering*. https://www.semanticscholar.org/paper/An-Insight-into-Machine-Learning-Techniques-for-and-Aggarwal-Bali/37672d25e0879aa7c29df7a4f6bf531ccb4b3716

[35] Sharmila, D.K., Devi, D.R., & Shanthi, D.C. (2022). Review on Latest Trends and Techniques in Predictive Analytics. *International Journal for Research in Applied Science and Engineering Technology*. https://www.semanticscholar.org/paper/Review-on-Latest-Trends-and-Techniques-in-Analytics-Sharmila-Devi/9c9322cb34a181ffe0bda3b1db831599386c98a6

[36] Kumar, V., & L., M. (2018). Predictive Analytics: A Review of Trends and Techniques. *International Journal of Computer Applications*. https://www.semanticscholar.org/paper/Predictive-Analytics%3A-A-Review-of-Trends-and-Kumar-M./ecb8132240e1827656363e19707381c295174240

[37] Gupta, V. (2021). The Significance of Predictive Analysis in Predicting the Performance of Members in the Organizations. https://www.semanticscholar.org/paper/The-Significance-of-Predictive-Analysis-in-the-of-Gupta/60ae8067116e5ea5ac87f1fdec44d7447cfeea26