National Research Journal of Information Technology & Information Science
Volume No: 12, Issue No: 2, Year: 2025 (July- December)
PP: 195-201
ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN FORECASTING THE RISK AND RETURN OF FINANCIAL PRODUCT

Tanu Solanki

Assistant Professor
At Chameli Devi Institute of Professional Studies, Indore (M.P.)

Deepa Joshi

Professor
At Shree Vaishnav Institute of Management and Science, Indore (M.P.)

ABSTRACT

The entire workings convert into advanced level after Artificial Intelligence (AI) technology. It is essential to understand the AI technology and its proper application. This research is conducted to analyse the use of AI in finance. In the Indian Financial System, Financial Market is a major component which deals with risk factors of Financial Products. The increasing complexity of Financial Product creates pressure to accurate analysis of the risk and return through AI forecasting tools. Risk and Return work parallelly if risk increases ultimately return increase. AI tools are a data driven decision making tool. It may be used for analysis of datasets through which risk & return analysis may be done.

This study is about AI tools and their application in forecasting the risk and return of Financial Product. We identify the application of AI tools including machine learning, Deep learning ,AI algorithms and other tools like Quantitate, Zest AI, Kensho etc to predict risk involved in Financial Product. Our research objective is to identified the advantage and disadvantage of AI tools and their application in forecasting. Through this research investors and financial companies better understand the financial product like Fixed Deposit, share, Debenture etc. and their pros and cons.

The study is based on the secondary data and review existing literature of AI used in finance risk management .The expected result of this research is to identify effectiveness of AI tools and their application in managing the risk and help investors for investment decision making.

Keywords: AI tools, Forecasting Risk and Return, Machine Learning, Deep learning, financial Product

INTRODUCTION

Many Financial Companies Faced Challenges for accurate forecasting the Risk and Return of Financial Product .Traditional Method of forecasting used Statistical Models like Regression, Time series analysis and Black Scholes Model for Linear Relationship and Stationary Data but have some limitation for capturing the complex data, non-linear Relationship and large dataset. The increasing availability of large or complex data have create opportunities for Artificial Intelligence (AI) to better handle the complex data and give accurate results.

AI technique include Machine learning Model for authentic prediction ,handle the complex dataset ,non- linear relationship and adopt to market volatility. Through AI application our investors ,financial institutions and regulators accurate predict the risk involved in Financial Product and also improved their decision related to investment.

Traditional methods are well established but limited ability to handle complex data may not

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

adapt the changing market conditions. While machine learning adapt the changing market condition and ability to manage the complex datasets.

This study intents to explore the capacity of Artificial Intelligence (AI) in financial forecasting. Through application of Machine learning models, Financial institution get significant benefits include improved accuracy, improved efficiency ,improved risk management, improved investment decision.

LITERATURE REVIEW

Chernysh ,Smishko et.at.(2025) in their Research Paper title 'The Role of Artificial Intelligence in Financial Analysis and Forecasting: using Data and Algorithms' describe the role of AI and its application in Banking sectors. In this Research paper forecasting is based on Stock price and Currency rates. The research objective focus on Risk management and accuracy. It give results through machine learning models such as ARIMA, Gradient Boosting Machine. All the models show 78%-88% accuracy in forecasting the stock Prices. The conclusion show AI can be used to better financial prediction, faster decision and better Risk management.

Sari, Indrabudiman (2024) in their Research Paper title "The Role of Artificial Intelligence (AI) in Financial Risk Management" Authors describe the financial risk such as Market risk ,Operational risk, Liquidity Risk and also describe the role of AI in mitigation of risk. Artificial Intelligence (AI) process the complex data with accuracy and speedily detect the risk.AI include machine learning ,there are two types of machine learning Supervised learning and unsupervised learning. Supervised learning is used to collect the data and unsupervised learning is used to identify the patterns and relationship in the data. In this way AI help to reducing the risk and improving the investment decision.

Rita Jain(2023)in her research paper tittle "Role of artificial intelligence in Banking and Finance" describe several benefits of AI application in Finance and Banking such as cost reduction, Improved decision making and enhanced efficiency etc. AI algorithms utilized for detection the fraud in business and finance. The conclusion of this paper is through AI application financial institution improve decision making and enhanced efficiency in working.

Rajesh Kumar,(2021) in his research paper title The role of Artificial Intelligence (AI) in portfolio management and financial forecasting .According to the author role of AI in portfolio management is very helpful for investment decision making. AI manage the complex datasets, identifies patterns, uncover patterns and generate accuracy in a real time. In his paper author also formulate the some challenge which is faced at the time of adoption of AI in finance such as cost of implementation, cyber securities threats etc. This challenge is addressed by regulator, institution and to ensure that AI adoption in finance remain beneficial for all. Ultimately conclusion of this research is AI adoption makes a life easier.

OBJECTIVES OF STUDY

1. To make a comparative analysis between Traditional technique of forecasting and Artificial Intelligence (AI) technique.
2. To identify the efficacy of Artificial Intelligence (AI) tools in forecasting the Risk and Return of Financial Product.

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

RESEARCH METHODOLOGY

This Research paper is based on the secondary data and proper review of existing literature of application of AI in finance. Data is collected from the online database like google scholar and websites to give authentication of results. Comparative analysis between traditional and AI techniques. Conclusion is about effectiveness of AI models and their application for forecasting Risk and Return of Financial Products.

Traditional Method of Forecasting are significant because they are-

Easy to Implement-Traditional Method used statistical models like linear regression or moving average which is easy to understand and implement require less data analysis skills.

Cost effective- Traditional method is a cost effective because it uses less computational power and resource as compared to advanced technology and fit for organisational budget.

Rely on stable environment -Traditional methods is rely on stable environment where past trends are likely continue, it give accuracy in forecasting.

Traditional Method of Forecasting cannot be used for some task because they are-

In ability to capture complex data-Traditional methods are incapable of analysis a complex or large datasets .It work on a stationary data or linear relationship.

Based on historical data-Traditional methods is based on historical data which doesn't fit for the future condition or environment may not grab all relevant information.

In capable in changing environment-Traditional methods work on a stationary data or simple data. It cannot analyse the large dataset or may not give the accurate forecast in long run.

Time Consuming-Traditional Method take a time for processing or gathering the data or analysis especially in large datasets.

Human Error and Bias -Traditional methods of forecasting is depends on human expertise, which create error or mistake at the time of forecasting and also makes a biased decision making.

Artificial Intelligence (AI) techniques are significant because they enhance the performance with:

Increased Accuracy-AI models identify the complex pattern or non linear relationship and analysis the large datasets or produced the more precise prediction of risk and return than traditional methods.

Rely on changing environment-AI techniques are adapt the changing environment analysis the complex or large datasets and identify the changing patterns, ensuring forecasting remain relevant and accurate.

Reduced the Human error- AI models reduced the human error such as emotional investment decision making and also reduced biasedness in forecasting.

Fast processing -AI algorithms process the large or complex dataset quickly and give faster responses to changing environment and risk events.

Challenge and Limitation

Data security-Financial institutions deal with large data set such as customer personal information, trade information and market secret. Protection of this datasets it utmost

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

important. AI need for robust cyber security measure.

Ethical acceptance- AI system should operate within ethical boundaries and to avoid biased decision making, preventing malpractices. It is mandatory to monitor ethical issue arising from the use of AI in forecasting.

AI adoption -AI adoption in the organisation it's become the toughest challenge. It's required coordination and planning with system and also requires training for using the AI tools in organisation. Financial institution needs to invest proper money or resources for successfully adoption of AI.

Financial institution should pay attention to this challenge and unlock the AI potential in forecasting also face upcoming competition successfully in the increasing data driven world.

Comparative Analysis of Traditional Methods and AI technique

- Traditional method gives a less accurate result than AI technique.
- Traditional method identifies a linear relationship or consistent data while AI technique identifies a non linear relationship or complex datasets.
- Traditional method based on a manual or human expertise while AI technique is based on a date and algorithm.
- AI technique analysis the large or complex datasets faster than the traditional method.
- Traditional method used moving average, linear regression to analysis the simple dataset while AI technique use machine and deep learning algorithm.

Machine learning algorithm

- It is a branch of Artificial Intelligence (AI).
- It used data and algorithm.
- It is a set of command give to the computer to learn from data and make prediction.
- It gives capability to computer to learn itself without any programmed.
- It does provide statistical tool to analysis the

data. **Classification of machine learning algorithm**
Supervised machine learning -

- Learn from labelled data set.
- On the basis of label data sets come to make prediction with accuracy.

Different types of Supervised machine learning-
Linear regression-

- It is based on historical data.
- It predicts outcome on the basis of continues data.
- It reduces difference of actual value and predicted value through the use of **least square.**
- It identify the relationship between input (independent variables) and output (dependent variable)

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

Usages-Predict stock price, Credit risk etc

Decision tree-

- It handles the non linear relationship and also identifies the variables.
- It identifies the patterns, complex data set and makes prediction of risk and return.
- It's classify the categorical outcome and work on regression task to predict the continuous outcome.

Usages- Identify the credit risk involved in financial products.

Random forest-

- It works on multiple decision tree to improve accuracy in prediction.
- It used in both classification and regression task.
- Over fitting through ensemble approach.

Neural network-

- It has multiple layers to identify the complex pattern
- It also handle the non linear relationship and identify the dependent and independent variable

Usages- used for predicting outcome or image classify.

Unsupervised machine learning

- It is worked on unlabelled data.
- It identify the hidden patterns and grouping without any human intervention.
- It used cluster algorithm for identify the similarities and difference in the grouping data.
- Reinforcement machine learning.
- It is based on environment learning.
- It make prediction on stimuli provide by environment.
- Receive the feedback in the form of reward and punishment.

Deep learning algorithm

- It worked on unstructured data set.
- Here, only input is given rather than feature extraction and classification is done by computer itself.
- It is self learning.
- It inspired by the human brain.
- It called Artificial Intelligence AI neural network.
- It predicts the complex dataset through multiple layer of interconnected node and all layer works together for prediction and classifies data.

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

Classification of Deep learning algorithm

Recurrent neural network

It's recognised or handles sequential data such as time series data, neural language and speed recognition.

Usages–

- Predict price commodities price.
- Identify portfolio of investment on the basis of predicted risk and return.
- It's help for Risk management.

Long short -term memory network

- It is a kind of recurrent neural network.
- It is design to avoid long terms problem.
- It captures long term dependency in financial data.
- It also works on sequential data such a speech text etc.

Examples -Risk management, Price prediction

Convolutional neural network

- It is based on structured grid data.
- In this three layer -convolutional layer, fully connected layer, pooling layer.
- Image class, object detection, face recognition.

Usages -Market news analysis, Identify trading volume, Predict price through historical data

Artificial Intelligence (AI) tools

Kensho

- A Kensho AI tool is designed for data analysis and provide insights.
- It analysis the complex datasets, uncover hidden pattern, trends and informed decision making.
- Kensho transfer the complex data into under stable form.

Usages -Risk management, Portfolio management

Zest AI

- Zest use AI to provide financial advise to lenders,
- It help to identify credit score and hidden potential in borrower.
- It help bank for loan decision image and provide loan to discover borrower
- It analysis the large data then traditional credit score method.
- It helps in reducing the risk.

Results

The study demonstrates the AI technique and its application in finance for forecasting the risk and return of financial products. On the basis of a secondary data we conclude that AI

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

technique is more accurate than traditional methods. The review of existing literature shows that AI technique such as machine learning and deep learning algorithm have performed well in term of data complexity; uncover patterns and non- linear relationship.

KEY FINDINGS

Investment decision making- Through AI techniques financial companies and investors identify patterns and data complexity in financial product and improved their investment decisions.

Time saving - AI tool analyse the large dataset within a time rather than traditional method is a time constraints in analyse the simple datasets.

Accuracy - AI techniques provide the result of analysis with accuracy. It's help in decision making and risk management.

Automatic analysis- AI tools analysis the large amount of datasets automatically and quickly with accuracy.

CONCLUSION

The study is based on secondary data ,Through the review of research papers and websites data we found that AI application is more accurate in current scenario, large amount of data is available, need too proper analysis .Financial companies and investors use the AI tools for analysis the financial data and on the basis they forecasting the risk and return. There is some challenge for the application of AI in Finance such as cyber securities threats, Skilled workforce and many more but need to overcome this challenge through proper application of AI technique. AI enables financial companies and investors to make proper investment decision and risk management. AI includes both machine learning and Deep learning which performed task so well in term of robustness and accuracy.

AI makes life easier and its application in finance is anticipate to grow.

REFERENCES

1. Chernysh, O., Smishko, O., Koverninska, Y., Prokopenko, M., &Pistunov, I. (2024). The Role of Artificial Intelligence in Financial Analysis and Forecasting: Using Data and Algorithms. *Economic Affairs*, *69*(3), 1493-1506.
2. Sari, Y., &Indrabudiman, A. (2024). The role of artificial intelligence (AI) in financial risk management. *Formosa Journal of Sustainable Research*, *3*(9), 2073-2082.
3. Jain, R. (2023). Role of artificial intelligence in banking and finance. *Journal of management and science*, *13*(3), 1-4.
4. https://aitoolfor.org/blog/ai-vs-traditional-business-forecasting-methods/
5. https://constantlythinking.com/posts/ai-in-financial-forecasting--benefits-and-challenges/
6. https://www.geeksforgeeks.org/machine-learning-algorithms/
7. https://www.simplilearn.com/tutorials/deep-learning-tutorial/deep-learning-algorithm
8. https://woy.ai/p/kensho
9. https://toolsworld.ai/zest-ai/
10. Kumar, R. The Role of Artificial Intelligence in Portfolio Management and Financial Forecasting.