ASSESSING THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON BANKING RISK EVALUATION

Devendra Singh
Research Scholar (Law)
The Glocal University Saharanpur, Uttar Pradesh
Dr. Dharm Pal Khatri
(Assistant Professor) Research Supervisor
Glocal Law School & Jurisprudence,
The Glocal University, Saharanpur, Uttar Pradesh

Abstract

Artificial Intelligence (AI) is radically improving the assessment and management of financial risks, which is changing risk management in the banking industry. Banks are using artificial intelligence (AI) more and more to improve their risk management plans in the areas of credit, operations, and liquidity because they are intermediaries and bear inherent risks. The impact of AI on banking risk evaluation is summed up in this abstract, which emphasises how it may enhance operational risk management, strengthen liquidity management, and improve credit risk assessment through real-time forecasting and advanced data analytics. AI presents a number of obstacles, including model interpretability, issues with data quality, and the requirement for a strong risk culture, even while it offers significant advantages in terms of risk assessment, quantification, and monitoring. In order to preserve resilience in the face of changing financial conditions, increase shareholder value, and attain a balanced approach to risk and reward, banks must include artificial intelligence (AI) into risk management. The revolutionary potential of AI in improving risk management procedures is emphasised in this abstract, as is its crucial role in the future of banking.

Keywords:Influence,Artificial Intelligence,Banking,Risk Evaluation,Revolutionary

1. INTRODUCTION

The integration of Artificial Intelligence (AI) technology has brought about a major revolution in the finance industry in recent years. This shift is especially noticeable in the area of banking risk assessment, where artificial intelligence (AI) is starting to significantly alter conventional risk management techniques. AI-driven solutions are being adopted by banks and other financial institutions more frequently in order to improve their capacity to evaluate, control, and reduce several types of risk, such as fraud, market, operational, and credit risk. Artificial intelligence (AI) in risk assessment holds the potential to decrease human error, increase efficiency and accuracy of risk assessments, and facilitate real-time decision-making. But it also brings with it new difficulties and factors that need to be carefully considered.

Artificial intelligence (AI) technologies, like as machine learning, natural language processing, and predictive analytics, have the power to completely transform risk assessment procedures by using enormous volumes of data to reveal trends and insights that conventional approaches could miss. By analysing past data and spotting intricate correlations between factors, machine learning algorithms can improve risk assessment and prediction accuracy. In comparison to traditional credit scoring methods, artificial intelligence (AI) systems may assess creditworthiness by examining a borrower's transaction history, social media activity, and other non-traditional data sources. This allows for a more thorough understanding of risk.

Notwithstanding these developments, there are still difficulties in integrating AI into the assessment of banking risk. The use of data-driven models poses questions around security, privacy, and quality of data. Furthermore, if AI systems are not adequately managed, their propensity for biases could result in misleading risk evaluations. The "black box" problem—the opacity of AI decision-making processes—can make it more difficult for banks to comprehend and defend the results of automated risk assessments. Consequently, it is imperative that financial institutions tackle these concerns by implementing strong governance structures and procedures to ensure openness.

Furthermore, because technology is advancing so quickly, risk management techniques must constantly evolve and adapt. To preserve a competitive edge and guarantee regulatory

compliance, banks need to keep up with emerging AI technologies and their implications for risk assessment. This entails spending money on cutting-edge AI tools but also encouraging creativity and teamwork across the risk management and technology departments.

2.   REVIEW OF LITREATURE

Al-Ababneh et al. (2023) provide a comprehensive evaluation of the performance of AI technologies within banking institutions. Their study examines various AI applications, including machine learning, natural language processing, and robotic process automation, and their impact on banking operations. The authors highlight that AI technologies have significantly enhanced operational efficiency, risk management, and customer service. By analyzing case studies from several banks, the study demonstrates that AI-driven solutions have improved accuracy in risk assessment and fraud detection, leading to more informed decision-making.

Ashta and Herrmann (2021) offer an in-depth overview of the opportunities and risks associated with AI in the financial technology (fintech) sector. The paper explores how AI is reshaping various financial services, including banking, investment management, and microfinance. The authors identify key opportunities such as enhanced predictive analytics for investment strategies, personalized financial services, and efficient loan processing. Conversely, the study also highlights significant risks, including regulatory challenges, cybersecurity threats, and ethical concerns related to AI decision-making.

Bello (2023) focuses on the application of machine learning algorithms in credit risk assessment, offering both an economic and financial analysis. The study examines various machine learning techniques, including decision trees, random forests, and neural networks, and their effectiveness in evaluating credit risk. Bello highlights that machine learning models can significantly enhance the predictive accuracy of credit risk assessments by incorporating a broader range of data sources and identifying complex patterns that traditional models may overlook.

Bhatore, Mohan, and Reddy (2020) present a systematic literature review focusing on machine learning techniques for credit risk evaluation. Their comprehensive review encompasses a wide range of machine learning methodologies, including supervised and unsupervised learning

algorithms, and evaluates their effectiveness in credit risk management. The authors categorize the reviewed studies based on algorithm types, such as logistic regression, support vector machines, and ensemble methods, and discuss their strengths and limitations. The review highlights significant advancements in predictive accuracy and the ability of machine learning models to handle large and complex datasets.

Doumpos, Zopounidis, Gounopoulos, Platanakis, and Zhang (2023) explore the integration of operational research (OR) and artificial intelligence (AI) methods in banking, focusing on their applications and contributions to various banking operations. The study provides a detailed examination of how OR techniques, such as optimization and simulation, are combined with AI methodologies, including machine learning and data mining, to enhance decision-making processes in banking. The authors emphasize the role of these integrated approaches in improving risk management, customer relationship management, and operational efficiency.

3. RISK MANAGEMENT IN BANKS

From a business standpoint, financial risk is the unpredictability of events that could negatively impact a company's profits. Financial intermediaries, banks move money between units of the economy that are in excess and those that are in deficit. Due to the information asymmetry that exists between the units/parties, these economic units have a tendency to favour utilising an intermediary. As a result, rather than going to the person or party that is the unit of surplus, the risk related to the transaction is transferred to the bank, acting as the intermediary. The possibility of losing all or a portion of the investment poses a risk to the bank. This risk is the likelihood that the actual return on an investment will be lower than the anticipated return. One essential element of banks' business models is risk management (DeAngelo Stultz, 2015). Identification, measurement, and monitoring of the various risk factors that a bank encounters, such as market, credit, and liquidity risks, constitute effective risk management. Thus, controlling these risks is a fundamental aspect of banking. But, the idea of risk for a bank can have both positive and negative effects, or upside and downside risk, as well as present a chance to increase a bank's worth. To achieve the primary objective of increasing shareholder value, a bank needs to take calculated risks that should pay off.

In the end, it may be expensive for shareholders if excessive precautions are taken to reduce risk at the price of shunning lucrative projects with higher risk. Therefore, a bank's risk management objective is to determine the ideal amount of risk for the organisation rather than to completely eradicate risk, as could be desired from the standpoint of its shareholders. In the end, this will decide how much wealth is generated for the bank's stockholders.

The risk culture that a bank has established is crucial to its risk management strategy. A company's culture is exceedingly complex, and as it permeates every aspect of the business, changing it can be quite challenging. It is the outcome of actions and attitudes, the values that the organization's members uphold, strategic choices made, the organization's experiences, and any underlying presumptions.

A bank's mindset and willingness to take on risk are factors that contribute to its objective of maximising shareholder profit. An illustration of a flawed risk culture was the careless incentive program for bank workers, a pervasive behaviour that contributed to the Great Financial Crisis. At the time, many bank employees' compensation and bonuses were based primarily on sales and profit targets, which did not account for the calibre of the loans or sales being made. Following the Great Financial Crisis, research revealed that banks with high levels of profitability prior to 2008 were most inclined to take on more risk. Before the Great Financial Crisis, there were several instances where people cheated to surpass their goals. For example, Jérôme Kerviel of Société Générale lost the bank a total of 4.9 billion. This instance illustrated the shortcomings of inadequate control measures and a weak risk culture. When combined, they would be disastrous for the bank.

The risk culture of a bank can influence its structure, and this is especially true in light of the UK government's recent introduction of ring-fencing regulations (Cullen, 2018). Ensuring that there is adequate internal communication within the business to properly inform employees of the bank's risk criteria and attitude towards risk is a crucial part of building a strong risk culture. Employees will be able to discern between dangers that the business accepts and those that should be avoided thanks to this.

Risk governance is an important part of a bank's risk management as well A bank with sound governance practices will have systems in place to determine the ideal amount of risk and ensure

that it does not deviate too much from this number. These systems will assist managers in balancing risk and reward and optimising value while making sure they adhere to all banking laws.

In a bank, risk management is the responsibility of the Chief Risk Officer (CRO). The person needs official clearance from the relevant regulator in order to occupy the post of CRO. Subsequently, the CRO answers directly to the CEO and the chairperson of the board as a senior executive (CEO). In addition to making ensuring that the bank's strategy plan reflects its risk appetite, the CRO will meet and interact with the bank's Board on a regular basis to discuss risk-related matters .Establishing a risk framework that the bank will use to identify and manage the quantitative and qualitative risks that the organization faces is the CRO's responsibility. The "Three Lines of Defence" approach (see Figure 1.1) is a popular risk governance paradigm that is frequently used to guarantee an ideal structure.
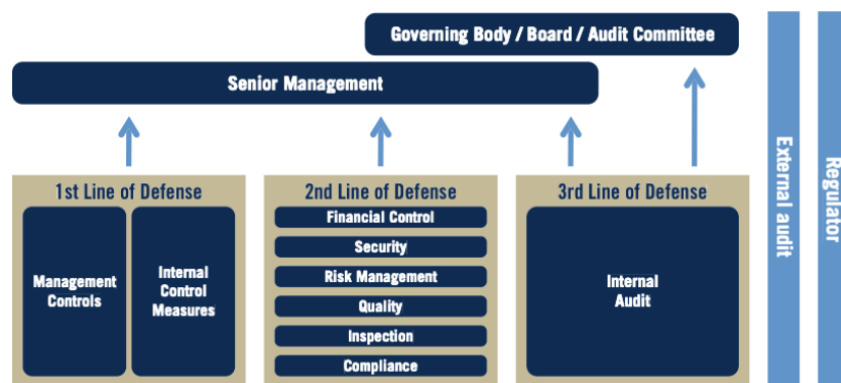

Figure 1: An example of the "Three Lines of Defence" paradigm

4.ARTIFICIAL INTELLIGENCE

The idea of artificial intelligence was first presented in 1955, hence the phenomenon is not new Artificial Intelligence (AI) is described as the theory and development of computer systems that display traits typically associated with human intelligence. To improve human-machine systems, the main scientific objective of artificial intelligence (AI) is to have a deeper understanding of the elements that allow intelligent behaviour in people.

Current/narrow AI (non-biological intelligence), artificial general intelligence (the capacity to perform any cognitive task to the same degree as a human), and superintelligence (general

intelligence that greatly surpasses human levels) are the three main categories of AI that are currently recognised. Artificial general intelligence and superintelligence remain beyond the reach of present technology, despite the rapid speed of technological advancement. The question of whether or when artificial general intelligence and superintelligence will ever be created is still up for debate. Although AI can detect word sequences at this point in its development, it cannot understand this input in terms of practical applications. speech recognition, learning under uncertainty, decision-making, and visual perception are a few tasks that modern AI is capable of performing. Artificial Intelligence is comprised of many strategies that enable it to imitate human behaviour. These days, machine learning, deep learning, speech recognition, natural language processing, and visual recognition are some of the most pertinent in the financial services industry

Through the use of algorithms to extract patterns from data, computers can learn on their own through a process known as machine learning It comes from a rapidly growing field of computational algorithms that uses ideas from many other fields, such as information theory, control theory, probability and statistics, and more.

Unsupervised and supervised learning are the two primary categories into which machine learning algorithms can be separated.

Three fundamental elements comprise unsupervised learning: a cost function, a model, and a dataset. With no regard to labels, its main purpose is to help one grasp the underlying structure of a dataset. With the important exception that the data is labelled, supervised learning combines all of the elements of unsupervised learning.

Supervised learning can quantify accuracy in a trustworthy manner and is mostly used to help with categorization.

Artificial neural networks are the foundation of deep learning, a subset of machine learning a neural network is a collection of interconnected neurones that have the capacity to affect the actions that individual neurones or networks take.

4.1 Uses in non-banking industries

AI is being applied in many different industries and has a wide range of applications. Although its introduction and application have varied, artificial intelligence (AI) technology is having an

impact on a number of industries, including manufacturing, transportation, healthcare, and finance. There is a lot of discussion about the possible uses of this technology. However, the way a lot of businesses function has already been revolutionized by AI, having a substantial impact on them.

• AI is starting to govern robotics in manufacturing, leading to notable advancements in accuracy and productivity that are altering the operations and procedures of manufacturing firms. • AI is being used in transportation at a rapid rate; according to studies, since human error causes most accidents today, AI will eventually lower the number of road deaths developments in self-driving automobiles have the power to drastically alter the transportation sector.

• The application of AI has also spread throughout the communication sector. The globe currently uses Apple Inc. services like Siri and Google Translate, which have substantial advantages. The healthcare sector is another one that AI is expected to help.

5. ARTIFICIAL INTELLIGENCE APPLIED TO RISK MANAGEMENT IN BANKS

Regarding how AI might be developed and integrated to better serve more traditional financial services and operations, there has been a boom of interest and commentary since the emergence of financial technology, or FinTech. Research on the effects and potential effects of AI on bank risk management is scarce, despite the fact that wealth management and investment banking benefit from its use. This is a topic that needs more investigation and analysis.

As was previously said, banks are vulnerable to a variety of hazards, and effective risk management calls for making sure that these risks are effectively recognised, quantified, and tracked. Credit, liquidity, reputational, and operational risks are a few of the primary financial hazards. This section will examine the body of research and offer a critical analysis of how artificial intelligence (AI) can be used to identify, quantify, and track each of these dangers.

5.1 Credit Risk

Lending money to clients is one of a bank's primary functions. Adherent risk exists since there is no assurance that the client will reimburse the bank. Credit risk is the likelihood that a customer

may breach a contract or fail to repay a loan that the bank has provided, resulting in an economic loss for the bank. A decline in a counterparty's creditworthiness is another type of credit risk It is among the biggest risks that banks encounter, and managing it can be challenging.

The Basel rule acknowledges credit risk and mandates that banks maintain capital reserves to guard against itDepending on the complexity and kinds of credit activities they engage in, banks have different credit risk management procedures in place. The probability of default (PD), exposure at default (EAD), and loss given default (LGD) must all be calculated in order to properly describe the credit risk computation. For a bank to be successful, each of these three credit risk drivers must be recognized and measured.

5.2 Operational Risk

Operational risk includes potential losses resulting from breakdowns in accounting, operational, and internal control systems; it also includes procedures and processes going wrong; and it includes personal supervisory tasks going wrong due to fraud and human mistake (Brown, Goetzmann, Liang and Schwarz, 2008). This is a risky situation for a bank since it involves several separate factors, each one of which could cause a large loss if it materialises. The process for determining, quantifying, and tracking operational risk should be in line with the operational risk guidelines that were first established as part of the Basel II framework (Guill, 2016), but have since undergone revisions. A standardised measuring approach (SMA) for operational risk has been created by the BCBS. The internal loss multiplier, a risk-sensitive part of operational loss data that is unique to the bank, is combined with the business indicator (BI), a representation of operational risk exposure, in this single method approach (BIS, 2016). Three components make up the BI:

1. the component related to interest, dividends, and leases

2. the component related to services

3. the financial component

5.3 Liquidity Risk

Making sure banks have enough liquidity to cover depositor withdrawals and loan requests is a top priority for them. For banks to survive and to fulfil their immediate financial responsibilities, this is essential.

Low liquidity can have serious consequences, including the possibility of bank insolvency the Basel III framework has focused attention on liquidity and requires banks to follow regulatory criteria and have enough liquid assets to cover their cash requirements.

For this reason, a bank places a great deal of importance on the measurement, monitoring, and assessment of liquidity risk.

6. CONCLUSION

AI has revolutionized financial risk assessment and management in banking. As financial intermediaries, banks confront significant risks. AI can improve risk assessment processes across credit, operational, and liquidity aspects. Banks can better detect, measure, and monitor risks using AI technologies like machine learning algorithms and advanced data analytics, improving risk management and decision-making. AI improves credit risk assessment predictive accuracy, operational risk management by spotting anomalies and inefficiencies, and liquidity management through real-time analysis and forecasting. AI incorporation into risk management raises concerns about model interpretability, data quality, and risk culture. Banks must use AI in risk management to balance risk and reward, maximise shareholder value, and stay resilient in a complicated financial climate.

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Devendra Singh
Dr. Dharm Pal Khatri

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