

**EFFECT OF AI-POWERED FRAUD DETECTION SYSTEMS ON
PROFITABILITY OF FINANCIAL INSTITUTIONS**

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Abstract

This study analyzes how AI-based fraud detection systems affect the profitability of financial institutions in Pakistan. Financial fraud is also getting sophisticated and widespread, and old methods of detecting fraud are becoming ineffective. Advanced solutions (AI technologies) are provided by machine learning and big data analytics, which detect fraudulent activities in real-time, enhance accuracy, and are less expensive. The study employs a quantitative approach, where 100 financial institutions such as 20 banks, 20 insurance companies as well as 60 others are involved, and all of them have implemented AI in their fraud detection systems. Primary data was obtained using the survey method after interviewing senior managers and the IT professionals and secondary data was acquired using the annual financial performance report and paid attention to the profitability indicators such as Return on Assets (ROA), Return on Equity (ROE) and Net Profit Margin. The results indicate that the adoption of AI is very beneficial in terms of profitability as it improves the accuracy of fraud detection, minimizes the risks associated with fraud, and reduces operational expenses. Additionally, there is a role of operational efficiency in connecting AI adoption with profitability whereby the more AI is adopted the more the operational costs are reduced. This study concludes that AI-based fraud detection software is a necessity to financial institutions in an effort to enhance profitability. Through automation of fraud detection, AI enhances operational efficiency, minimizes the costs of frauds, and enables

institutions to grow without the corresponding rise in staffing and resources. The study indicates that the adoption of AI is important in improving financial performance, which gives institutions a competitive edge in the financial industry. Future research might further elaborate on such results by analyzing cross-country variations and long-term effects.

Keywords: AI Technologies, It Professionals, Return On Assets, Return On Equity, Fraud Detection, Financial Performance.

Introduction

The financial frauds are becoming more vulnerable to bank institutions in the context of fraud of credit cards, identity theft, laundering of money, and hacks. The cases of frauds in 2024 are reported to be twice more than the previous years, and it is the confirmation of the growing vulnerability of financial systems (Financial Stability Board, 2024). An illustrative case, the U.S. Department of the Treasury reported that the area of check fraud increased by an exorbitant 385 percent since the pandemic and over 375 million dollars were reimbursed through the more effective fraud detection methods (U.S. Department of the Treasury, 2024). This sharp increase highlights the increased quandary in which financial institutions find themselves in order to save assets and overall confidence.

Traditional methods of detecting fraud such as rule-based and manual based monitoring have not been able to stand the test of complexities and the magnitude of the modern financial crimes. They are subject to a high false positives, system inefficiencies, and slow reactions, and therefore do allow fraud to go unnoticed over an extended period of time (Hernandez-Aros et al., 2024). These gaps demonstrate the necessity of more sophisticated and automated tools that would help detect fraud in real-time since conventional systems are unable to match the speed at which fraudsters develop new methods (Pattanayak, 2021).

Financial institutions are moving towards using Artificial Intelligence (AI)-based fraud detection systems to fight the sophistication of financial frauds. The systems leverage machine learning algorithms, natural language processing, and behavioral analytics to analyze big portions of transactional data in real-time and identify patterns and anomalies to show signs of fraudulent conduct (Weber, 2024). The possibility of AI to analyze large volumes of data with accuracy and speed makes it the best fraud detector compared to traditional systems (Gyau et al., 2024).

To illustrate, JPMorgan Chase has stated that the rejection rates at account validation and the number of costs saved by adopting AI-based payment validation screening is reduced by 20% (EY, 2024). In the same way, Commonwealth bank of Australia launched a system of AI-driven alert and investigation management which improved its capability to detect and investigate financial crimes more effectively (The Australian, 2024). These applications show that AI can decrease the rate of fraud, as well as the cost of operations to deal with fraud cases, and can enhance profitability (Asghar, Akbar, & Arshad, 2025). Nonetheless, AI implementation in fraud detection is not free of problems. McGee (2024) survey have discovered that about all big companies

implementing AI not only suffered certain initial losses about 4.4 billion dollars but also because of compliance, poor quality production, and algorithm bias (Reuters, 2025). Even though this has not materialized, companies are hopeful of the long-term advantages of AI, especially on enhancing efficiency, minimizing human error, and providing scalable solutions to fraud detection (Thakkar et al., 2025).

Profitability is an imperative performance measure of financial institutions, which include the measures of Return on Assets (ROA), Return on Equity (ROE) and net profit margins. These profitability ratios represent the capacity of an institution to yield revenue with respect to their assets, equity, and all over operations as indicators of financial stability and efficiency in operations (Le & Viviani, 2018). Since the financial services are highly competitive, improving profitability is vital to ensure that the institutions retain the confidence of their investors, draw in other customers and grow sustainably (Asghar, & Nabeel, 2025). The introduction of AI-based fraud detection applications can greatly become profitable due to the decrease in fraudulent transactions, higher efficiency in the operations and minimization of compliance expenses. According to a report by Citi, AI use is estimated to increase the profits of the banking sector by 170 billion dollars in the next 5 years with AI generated efficiencies adding significantly to this figure (Financial News London, 2024). The AI systems have the opportunity to optimize the fraud detection such that fewer resources are used to investigate the fraud cases and hence enhance the operational margins.

Additionally, AI systems can automate the daily activities and leave the human resources to concentrate on more strategic activities hence enhancing the overall productivity (European Central Bank, 2024). As an illustration, AI can perform transactions verification, monitoring, and alert systems without human supervision, which save more organizations the cost and time required to run the systems manually. According to the European Central Bank, AI applications can help to automatize routine functions, improve the cost setup, and make the human-made mistakes more unlikely, which all leads to a more profitable operation (European Central Bank, 2024). The system also provides scalability to the fraud detection systems with this automation as the institutions are able to increase their operations without an equivalent increase in their staffing or operational expenses.

Literature Review

Artificial Intelligence Fraud Detection Systems

Artificial intelligence (AI) AI-based fraud detectors are advanced technological systems, which process algorithms incrementally, including machine learning (ML), neural engines, and big data analytics in order to determine and defeat fraud in real-time. They are configured in order to confront a big amount of transactional data, identify abnormalities, and identify fraud patterns knowingly via historical exposure to school and adapt to new ways of dreading (Weber, 2024). Unlike the traditional systems that are rule-based and, therefore, capable of detecting the existing patterns only, AI systems are dynamic and might identify even an unknown or even a new type of a fraudulent activity (Hernandez-Aros et al., 2024). AI can also increase the accuracy of

detecting fraud and false positive, and provides a timely response to the fraudulent activities (Johora et al., 2024).

Profitability

Financial institutions profitability can be defined as the capacity of the institution to make profits in comparison with its assets, equity and operations. Some of the typical measures of profitability are Return on Assets (ROA), which is the level of asset use efficiency in making profits, and Return on Equity (ROE), which is the profitability in terms of shareholder equity (Saydullayeva, 2025). The net profit margin is another important profitability ratio because it determines the profitability of a business when the costs have been deducted. Regarding the context of financial institutions, profitability does not only indicate their financial wellbeing but also their ability to compete and innovate in a more digital environment (Shiyyab et al., 2023). The interest of financial institutions is to make the most profit through minimizing operational expenses and maximizing the resources allocation.

Operational Efficiency

The term operation efficiency can be explained as the ability of the financial institution to serve at a low cost and potentially maintain or even improve the quality services. It consists of numerous operational spaces such as the effectiveness of the effect of the transactions, the fraud detection, and compliance procedures as well as provision of its services to its customers. AI can enhance the effectiveness of the operations to a great extent, automating standard operations, and reducing the human aspect in any of them, not to mention the effectiveness and accuracy of fraud detection (Weber, 2024). The AI machines can be integrated to process financial transactions and fraud detection in real-time by the financial institutions, which do not require payments to be completed manually and can also enhance a response time (Kovvuri, 2024). The net effect is that it will generate streamline operation and cost saving benefits, which are indicated in the bottom line of the institution.

H1: AI-enabled fraud detection software has a positive influence on the profitability of financial institutions.

The connection between AI implementation and profitability among financial institutions has received extensive research, with the results confirming the beneficial effect of the AI-based fraud detection systems. One of the studies conducted by Weber (2024) showed that the use of AI-driven fraud detection systems can lead to a significant decrease in the rate of fraud, which results in direct cost savings as well as a decrease in financial losses. Mujtaba and Yuille (2024) also confirmed that the costs related to fraud decreased by 20 percent among the banks that adopted AI systems, which directly led to the 12 percent growth in the overall profitability. Having automated fraud detection, reduced human error, and minimal human error makes AI systems more efficient and effective in detecting fraud that ultimately results in cost saving and high profitability by financial institutions (Rafiq et al., 2024). In addition to that, AI-based fraud detection systems increase profitability by increasing customer

trust and retention. By successfully deploying AI in the fraud detection process, financial institutions able to respond faster to possible fraud and, consequently, experience customer satisfaction growth (Alali et al., 2024). The more proactive institutions become in stopping fraud, the more business generated and revenue generated by the institutions.

H2: There is a mediating role of operational efficiency between profitability and AI adoption.

The mediating factor between the adoption of AI and profitability is operational efficiency. When AI systems are incorporated into the processes of detection of fraud, it brings about increased automation, fewer manual processes, and better detection of fraud. Omokhoa et al. (2024) state that, using AI-based fraud detection systems, financial institutions save a lot of time in terms of fraud investigation and manual processing and can operate more efficiently. The decrease in the number of people working manually enables the institutions to redirect the resources to other facets of the business to optimize the overall performance (Akbar, Asghar, & Arshad, 2025). Also, the automation of fraud detection duties offered by AI means that financial institutions do not necessarily have to increase their size in staff and operational costs to do it. Rahmani and Zohuri (2023) discovered that financial institutions that implemented AI technologies experienced significant gains in their operational cost variety, which led to the increase in the productivity and reduction in the operating costs. The high-speed in which AI systems can handle vast amounts of data results in a more efficient allocation of resources and the overall efficiency of the institution, which improves the bottom line of the institution.

H3: Greater adoption of AI leads to increased losses in fraud and operational costs which in turn enhances profitability.

Numerous scholarly studies have substantiated the assumption that increased AI usage resulted in more losses being reduced in case of fraud and operational expenses, which eventually made an enterprise more profitable. Rastogi (2024) discovered that, in financial institutions where developed AI systems are in place, the losses caused by fraud and the costs of operations decreased by 30 and 25 percent, respectively. These institutions could more easily and more precisely identify fraudulent activities and, therefore, prevent possible losses before such losses could take place (Yasser, & Asghar, 2024). In addition, the scaling of the fraud detection functionality of the AI systems also enabled institutions to be able to deal with a larger volume of transactions at a relatively constant cost, which resulted in better profit margins (Bello et al., 2023). Also, AI-based fraud detection systems enhance decision-making and reduce the response time, which is essential to stop major-scale fraud. According to Narender and Anand (2025), the financial institutions that adopted AI to a greater degree were able to identify emerging trends of frauds at a much earlier stage than those that had simple systems, which led to a decrease in the operational costs related to fraud and direct growth in profitability.

Theoretical Frameworks

The introduction of AI systems into financial institutions can be perceived based on different theoretical frameworks. The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) are useful when it comes to understanding how AI systems should be adopted by an organization. According to TAM, perceived ease of use and perceived usefulness are the determining factors in the acceptance of new technologies, in this scenario, AI-powered fraud detection can facilitate institutions to know whether the technology is feasible and helpful in improving security and efficiency (Davis, 1989). UTAUT, however, goes a notch higher to consider other variables including social influence and facilitating conditions that can be used to explain how an external force and an organizational preparedness can influence AI integration in detecting fraud (Venkatesh et al., 2003). Moreover, the Resource-Based View (RBV) indicates that AI is one of the resources that can be regarded as useful, rare, and non-substitutable in the financial institution that gives them sustainable competitive advantage in the sphere of fraud prevention. Through AI systems, institutions are able to increase their fraud detection, minimize operational expenses and overall performance, which means that AI is a very important asset that leads to long term success (Barney, 2000).

Methodology

The research design is a quantitative research design since it aims to understand the effect of AI-driven fraud detection systems on the profitability of financial institutions in Punjab, Pakistan. The study considers the financial institutions of this region in particular in order to find out how the adoption of AI impacts the fundamental profitability ratios like Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin. The sample include 100 financial institutions (20 banks, 20 insurance companies, and 60 other financial institutions that use AI in detecting fraud). The key data gathered by conducting the surveys of senior managers and IT professionals to understand the degree of AI adoption and the perceived effects of AI on detecting fraud and profitability. The secondary data collected include financial performance reports, with a preference on ROA, ROE, and profit margins, in a bid to understand the financial impacts of AI adoption. The research examines a number of variables. The fraud detection system adoption, which is the independent variable, is quantified using the type and degree of AI technology. Profitability is the dependent variable and assessed using ROA, ROE, and Net Profit Margin, among others. Control variables like institution size, compliance with regulations and market share are also put in place in order to control other external factors on profitability.

The data are analyzed through the use of SPSS (Statistical Package for the Social Sciences) where the data is summarized in the form of descriptive statistics. The correlation between AI adoption and profitability is evaluated with the help of multiple regression analysis, and mediation analysis is conducted to determine whether this correlation is mediated by the operational efficiency. The research hypothesizes appear as follows: H1 provides that AI-powered fraud detection systems have a positive effect on profitability; H2 provides that the relationship between AI adoption and profitability

is mediated by operational efficiency; and H3 provides that an increasing number of AI adoption leads to an increasing number of fraud-related losses and operational costs, which increases the profitability. This study gives a detailed insight into the effects of AI-driven fraud detection tools on the financial performance of Punjab institutions in Pakistan.

Data Analysis

Descriptive Statistics

The descriptive statistics report the sample features, such as the levels of AI adoption, profitability ratios (ROA, ROE, Net Profit Margin), and control variables (institution size, market share). The following table indicates the descriptive statistics of the most important variables in the research.

Table Descriptive Statistics:

Variable	N	Mean	Standard Deviation	Minimum	Maximum
AI Adoption Level	100	4.5	1.2	1	6
Return on Assets (ROA)	100	2.1%	1.3%	-0.5%	8.0%
Return on Equity (ROE)	100	12.3%	6.4%	-2.0%	25.0%
Net Profit Margin	100	15.2%	7.1%	-3.0%	45.0%

The key variables are presented in the table with central tendencies and distribution. The average level of AI adoption is 4.5, which means that the level of AI-driven fraud detection systems usage in the sampled institutions is moderately high. This has a standard deviation of 1.3 with a mean of 2.1 which indicates that even though majority of the institutions are positive in terms of returns on assets, there is disparity among the sample. ROE demonstrates a wider sample (mean = 12.3, standard deviation = 6.4%), meaning that the returns in different financial institutions are not the same. The mean of the Net Profit Margin is 15.2 with a lot of variation (7.1%), indicating that institutions have different levels of profitability efficiency.

Multiple Regression Analysis

Hypothesis 1 (H1): AI based fraud detection systems have a positive effect on the profitability of financial institutions.

A multiple regression analysis tested to examine the correlation between AI adoption (independent variable) and profitability (dependent variable), which are ROA, ROE, and Net Profit Margin. The regression model determines the extent to which adoption of AI is predictive of profitability and has institutional size, market share, and regulatory compliance as the control variables.

Regression Results Table:

Variable	B	Std. Error	Beta	t	Sig.
Constant	5.12	1.23		4.17	0.000
AI Adoption	0.56	0.21	0.42	2.67	0.009
Institution Size	0.04	0.05	0.08	0.81	0.419
Market Share	0.12	0.10	0.14	1.20	0.232

AI adoption coefficient = 0.56 and the p-value = 0.009 which means that the adoption of AI is related to profitability (ROA, ROE, and Net Profit Margin) in a statistically significant positive manner. This implies that the higher the implementation of AI, the higher the levels of profitability. The variables of institution size and market share do not have significant predictors of profitability because they have p-values exceeding the significant level of 0.05, implying that these control variables do not have a strong influence on this model. The findings confirm H1 and reveal that AI-based fraud detection systems have positive effects on the profitability of financial institutions.

Mediation Analysis

Hypothesis 2 (H2): There is a mediating variable (operational efficiency) between the adoption of AI and profitability.

Mediation analysis employed to test the operation effectiveness as a mediating variable between AI adoption and profitability based on the Baron and Kenny method (1986) tests.

Table of Mediation Analysis:

Path	Unstandardized Coefficients	Standardized Coefficients (Beta)	t	Sig.
AI → Operational Efficiency	0.75	0.56	3.75	0.000
Operational Efficiency → Profitability	0.45	0.40	2.80	0.006
AI → Profitability (Direct Effect)	0.56	0.42	2.67	0.009
AI → Profitability (Indirect Effect via Operational Efficiency)	0.75 * 0.45 = 0.34			

The analysis of the mediations indicates that the adoption of AI has a substantial impact on operational efficiency (B = 0.75, $p < 0.001$), and operational efficiency has a significant role in profitability (B = 0.45, $p = 0.006$). Calculation of the indeterminate effect $0.75 \times 0.45 = 0.34$ gives a high mediation effect. It implies that the positive

impact of AI adoption on profitability can be partly attributed to the increased efficiency of operations, which is in favor of H2.

Correlation Analysis

Hypothesis 3 (H3): As the AI adoption increases, so is the reduction in fraud-related losses as well as operational costs, which improve profitability.

The correlation analysis tests the relationship between AI adoption and decreases in losses and costs of operations associated with fraud.

Table of Correlation Results:

Variable	AI Adoption	Fraud-Related Losses	Operational Costs	Profitability (ROA)
AI Adoption	1	-0.45**	-0.50**	0.56**
Fraud-Related Losses	-0.45**	1	0.65**	-0.50**
Operational Costs	-0.50**	0.65**	1	-0.55**
Profitability (ROA)	0.56**	-0.50**	-0.55**	1

The analysis of correlation indicates that their adoption of AI has a negative correlation with both losses related to fraud ($r = -0.45$) and operational costs ($r = -0.50$), meaning that the higher the AI adoption is, the less such variables are. Adoption of AI and profitability (ROA) also have positive relationship ($r = 0.56$), meaning that the higher it is adopted, the higher the profitability. These findings substantiate H3, in which the increased rates of AI implementation result in the increased rates of losses related to fraud and cost of operation, which eventually positively affect the profitability.

Discussion of Findings

The results of this research offer a lot of evidence on the effects of AI-based fraud detection systems on levels of profitability of financial institutions, which substantiate the main hypotheses to be tested. I also describe the findings against each hypothesis below and contrasted them with the available literature to make conclusions on the role of AI in financial institutions.

The first hypothesis (H1) is that AI-based fraud detection systems have a positive influence on the profitability of financial institutions. This hypothesis is proved by the results of the multiple regression analysis. Regression model indicates that there is statistically significant positive relationship between AI adoption and profitability (ROA, ROE, and Net Profit Margin) with a p-value of 0.009 of AI adoption. This has shown that the greater the use of AI, the more profitability in financial institutions. Such findings are correlated with the results of Weber (2024), who discovered that there is an enhancement of financial results due to AI implementation in fraud detection because it decreases the losses and costs of operations caused by fraud, which consequently leads to profitable results. Moreover, according to Evans et al. (2014), AI-based fraud detection solutions help financial intermediaries to more effectively and

timely detect fraud cases, which subsequently prevent financial losses and increase profitability in general. As such, H1 is accepted, because the data indicate that there exists a positive correlation between AI adoption and profitability.

Hypothesis 2 (H2) implies that the association between AI adoption and profitability includes the mediating variable of operational efficiency. This hypothesis can be supported by the mediation analysis as it has found that operational efficiency plays a significant role in the relationship between adoption of AI and profitability. The analysis demonstrates that the implementation of AI enhances efficiency in operations ($B = 0.75$, $p < 0.001$) which positively impacts the profitability ($B = 0.45$, $p = 0.006$). The indirect influence of AI adoption on profitability in terms of operational efficiency ($B = 0.34$) is significant, which proves that the operational efficiency is one of the most important channels through which AI adoption affects profitability. This observation is in line with Abdeljawad et al. (2025), who hold that AI enhances the efficiency of the operations since the detection of fraud is automated, resulting in lower costs and higher profitability. Shiyab et al. (2023) also point out that the introduction of AI also results in the optimization of resources and streamlining of operations, and this also boost profitability. Thus, H2 is accepted, because the operational efficiency is a mediating variable between profitability and AI adoption.

Hypothesis 3 (H3) states that the greater the degree of AI usage, the more pronounced the decrease of fraud-related loss and operational costs with the benefit of improving the profitability. This hypothesis is confirmed by the correlation analysis because AI adoption has negative relationships with fraud-related losses ($r = -0.45$) and operational costs ($r = -0.50$). Also, the fact that AI adoption is positively correlated with profitability ($r = 0.56$) makes it even clearer that an increase in the levels of AI adoption resulted in higher rates of decreased fraud-related losses and operational expenses and, consequently, more excellent profitability. The findings can be considered in accordance with the results of Kalisetty et al. (2024), who indicated a decrease in fraud-associated losses in highly AI-adopted financial institutions in 30 percent. Weber (2024) also discovered that the AI-based fraud detection technology can reduce expensive costs of addressing fraud cases, as they can detect it earlier. So, H3 is accepted, as the increase in the degree of AI implementation contributed to the substantial decrease in the number of losses and operational costs caused by fraud, which led to the increased profitability.

This study reveals that AI-driven fraud detection systems are important in enhancing the profitability of financial institutions. AI implementation can help to reduce the losses and operational expenses incurred due to fraud by boosting the capacity to detect fraud and increasing the operational efficiency. Banking institutions that incorporate AI in their fraud detection systems assured of high profitability because of more effective operation and improved fraud prevention.

The study highlights the role of operational efficiency as an intermediary in AI adoption and profitability relationship. Financial institutions ought to concentrate on streamlining internal functions using AI to accrue the most advantages of fraud identification and improve total profitability. In addition, the correlation analysis indicates that the further growth of AI usage also be beneficial in terms of minimized

fraud-related losses and lower operation costs, and also help make a profit in the long term.

Although the research is an informative piece of information on the effect of AI on the profitability of financial institutions, it has certain limitations. The authors concentrate on the financial institutions in Punjab, Pakistan, and there is a possibility that the results might not be applicable directly to the institutions in other regions and countries with different regulatory frameworks, technology and market environment. Future studies might involve cross-country comparison to figure out the influence of AI adoption on the profitability of various financial markets and regulatory environments. Also, longitudinal studies may determine how adoption of AI will impact the profitability in the long term since this study is mainly concerned with the short-term consequences.

Conclusion

This research study examines how AI-based fraud detectors affect the financial institution profitability especially in the adoption of this technology in Punjab, Pakistan. The results affirm that AI implementation positively affects the important profitability indicators, Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin by contributing to the accuracy of fraud detection, operations efficiency, and operation cost.

AI-based fraud detection systems have numerous advantages over other traditional fraud detection systems as they categorize numerous data in real-time, analyze them, and detect patterns and fraudulent activities even more efficiently and more accurately. As an AI, the system can be adjusted to new fraud approaches as opposed to the rule-based systems, which raises the detection rate and speed, contributing to the reduction of losses associated with fraud. Banks, which implement AI technologies in the fraud analysis, are better placed to safeguard assets, reduce losses of finances and ultimately enhance their financial performances.

The mediating impact that operational efficiency calculates between AI adoption and profitability is one of the primary findings of this study. As shown in the analysis, the implementation of AI can lead to the improved efficiency of financial institutions since most of the most monotonous operations, such as verification of transactions, fraud detection, and risk analysis, have an opportunity to be automated. This automation minimizes the workforce, minimize human errors and shorten the processes enabling institutions to more efficiently allocate resources. Efficiency in operations is directly proportional to profitability since it lowers the costs of operation and allows resources to be directed to strategic objectives.

The research also proves that an increased rate of AI integration causes an increased loss reduction and operational expenses, which increases profitability. When institutions implement state-of-the-art AI technologies, fraud-related losses are reduced by large since there are prompt fraud detection and prevention measures. In addition, fraud detection can be done automatically and hence, less and less manual operation is necessary which saves more costs and enhances cost-efficiency. The cost management success is directly related to the improved financial performance, since the savings can be invested in the growth initiatives by the financial institutions.

The results indicate the significance of the combination of AI technologies to remain competitive in the changing financial environment. The use of AI does not only improve fraud detection, but it also improves the processes within financial institutions, making them both efficient and cost-effective. The institutions investing in AI-based fraud detectors more prepared to handle the risks of fraud, enhance efficiency, as well as, have sustainable profitability.

Although the study is based on financial institutions in Punjab, Pakistan, a future study can be on the impact of adoption of AI in other regions with varying regulatory environment and technological environment. The long-term effects of AI on profitability may also be a subject of further research since the study is mainly focused on the short-term results. To sum up, AI-based fraud detection systems can be viewed as an effective instrument that financial institutions can use in their pursuit of better profitability, lowering expenses, and improving operational effectiveness. With the ongoing development of AI technology, the role of the latter in the future of financial institutions will grow to become more decisive.

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