



# AI-Supported Financial Analysis and Iraqi Bank Performance Evaluation

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**General Background:** The rapid digital transformation of the banking sector has increased the need for advanced tools to enhance financial performance evaluation. **Specific Background:** In the Iraqi banking industry, traditional financial analysis methods remain dominant despite growing interest in artificial intelligence (AI)-driven approaches. **Knowledge Gap:** Limited empirical evidence exists on the effectiveness of AI-supported financial analysis in improving accuracy and predictive capability within developing banking contexts. **Objective:** This study aims to assess the impact of AI-driven financial analysis on evaluating and predicting the financial performance of Iraqi banks. **Methods:** Using a descriptive-analytical approach, the study examines key financial indicators—capital adequacy, profitability, liquidity, activity, and leverage—applied to a sample of Iraqi banks based on 2023 financial statements, and employs a linear regression model as an AI technique for prediction. **Results:** The findings reveal a close alignment between actual and predicted values, indicating that AI-assisted analysis provides acceptable predictive accuracy while enhancing evaluation efficiency. **Novelty:** The study integrates traditional financial indicators with AI-based modeling in the Iraqi banking context. **Implications:** The results highlight the importance of adopting AI in financial analysis systems to improve decision-making quality and align with contemporary digital transformation trends.

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## INTRODUCTION

The business environment has been undergoing a lot of fast technological growth in the recent years especially in information systems and the shift towards the digital economy. Such advancements have made the financial and accounting activities more difficult, particularly in the banking industry. The technologies of artificial intelligence have also led to the essential changes in the manner of financial analysis due to the acceleration of the data processing process and improvement of the accuracy of the analytical results. Consequently, AI-supported financial analysis has become one of the contemporary methods, which enhances the effectiveness of the financial data analysis and assists the decision-makers in the modern banking setting.

That is why, in the given context, this research aims at analyzing the impact of applying AI-based financial analysis on the assessment of the financial performance of Iraqi banks through the prism of applied banking. The research methodology applied is a scientific one which is founded on the research of financial indicators and utilization of financial performance prediction models to make concrete and reliable findings that serve financial and administrative decision-making.

### Financial Analysis

Financial analysis is considered one of the fundamental tools used to interpret the interrelationships among the elements of financial data—assets, liabilities, expenses, and revenues—in order to generate useful information by linking these elements. Such information supports decision-making for various users. To realize such outcomes, it will be necessary to utilize a set of rules, techniques, and mathematical formulas requiring sufficient time, effort, and expert knowledge, especially in the applied sciences of financial, administrative and accounting sciences ([Al-Dabbas, 2022](#)).

Financial analysis is an input that must be taken in the process of financial planning since one has to know the financial position of an organization before making future plans. It helps organizations to see their strengths and weakness in their financial position; when they discover their weakness, the management can use it, but when they discover their strength, then they should use it promptly to prevent affecting the future plans. Furthermore, financial analysis is used to present the stakeholders with the pertinent information regarding the financial status of the organization, the level of performance during a certain time, the level of success or failure in meeting the planned goals, and aid the decision-making process within the organization ([Yordanova & Hristozov, 2025](#)).

The concept of financial analysis may also be described as a practice that involves rules, standards, and principles that are supposed to gather data and information related to the financial statements of an entity, categorize them, and provide a thorough and precise analysis. The modern finance study is concerned with the analysis and interpretation of the contents of financial statements in order to evaluate and understand what they entail and how this is reflected in the status and position of the economic unit. It also aims at using this

information in planning, policy direction and decision making and also in analyzing the previous performance and coming up with future strategies. Financial analysis is relevant and accurate, which contributes to making sound decisions, thus contributing to better decision-making of the information users and decision-makers, as opposed to relying on random decisions or personal judgment ([Al-Jubouri, 2014: 102](#)).

### Objectives of Financial Analysis

Financial analysis is intended to support decision-makers in evaluating the strength of an entity's financial position and in forecasting its future performance, with its specific objectives varying according to the interests of the stakeholders who rely on it. In general, financial analysis aims to determine the financial position of the economic unit and evaluate its profitability, while also assessing how financial performance can guide investors in selecting appropriate investment opportunities. Furthermore, it helps determine the entity's ability to obtain financing and fulfill its debt obligations, as well as supports the implementation of financial policies designed to enhance financial stability. Financial analysis also serves to clarify the overall trend of the entity's activities, strengthen internal control through informed decision-making, and evaluate the adequacy of financial, operational, sales, and planning policies within the organization ([Al-Jubouri, 2014](#); [Al-Dabbas, 2022](#)).

### Financial Ratio Analysis

Financial ratios are defined as logical relationships that link elements presented in the financial statements of an economic entity. These elements may appear within a single statement or be distributed across two different statements. Financial ratio analysis is considered one of the most prominent and oldest tools of financial analysis. After verifying the accuracy of the financial statements under examination, the financial analyst compares their figures across successive periods in order to understand changes in financial performance and position.

### Financial Indicators Used in Banking Performance Evaluation

The financial indicators used to evaluate banking performance in the applied part of this study can be summarized into several key categories commonly discussed in the financial literature. Although numerous indicators have been developed to assess banking performance—often with multiple measures representing each indicator—the most widely used include capital adequacy (solvency) indicators, profitability indicators, liquidity indicators, activity indicators, and leverage indicators. These indicators provide a comprehensive framework for evaluating the financial condition and operational effectiveness of banks, and each of them will be discussed in greater detail in the following sections ([Al-Nuaimi, 2005](#)).

### Capital Adequacy Indicators (Solvency Indicators)

Capital is a fundamental aspect in commercial banks, as it plays a crucial role in safeguarding depositors' funds and

addressing various financial risks. From an accounting perspective, capital is primarily viewed as equity; however, in a broader sense, it also includes bonds and securities issued by the bank due to their contribution to enhancing financial stability ([Mehassouel et al., 2022](#)). Moreover, capital serves as a key buffer in absorbing potential losses arising from banking risks, particularly those related to leverage ([Hindi, 2006](#)). In evaluating capital adequacy, several important indicators are commonly used, including the equity-to-total deposits ratio, which reflects the bank's ability to protect depositors' funds ([Fahd, 2009](#)), and the equity-to-total assets ratio, which indicates the extent to which the bank relies on internal financing to support its assets ([Matar, 2006](#)).

### Profitability Indicators

Profitability is the main goal of all commercial banks because this will lead to the maximization of shareholder wealth and increase in financial stability. Profitability measures are used to determine the effectiveness of the bank management in earning returns on the available resources. Some of the most significant of such indicators include Return on Assets (ROA), Return on Equity (ROE), Return on Deposits, and Return on Available Funds, which are all indicators of efficiency in the ability of the bank to produce revenues, as well as the effectiveness with which it manages those assets ([Al-Shabib, 2012](#); [Al-Rubaie and Radhi, 2011](#); [Hindi, 2006](#)).

### Liquidity Indicators

The liquidity is the capacity of a bank to fulfill its immediate liabilities and transform its assets into cash without losing a lot of money. The liquidity indicators are ranked as important tools in determining the capacity of the bank to withstand the pressure of financial expenditure. These indicators are the most significant and they consist of legal reserve ratio, cash balance ratio, cash to total assets ratio and current ratio, which cumulatively indicate the level of safety and liquidity in the bank ([Al-Rubaie, 2011](#); [Hindi, 2006](#); [Fahd, 2009](#); [Al-Nuaimi, 2005](#)).

### Leverage Indicators

Leverage indicators are applied to assess how banks operate in the sense that the capital structure of these banks is dependent on how much debt financing is used instead of equity. These indicators point out the amount of financial risk and the capacity of the bank to fulfill the financial requirements. The ratio of deposits and current accounts to capital and reserves and the ratio of capital and reserves to the total assets are some of the most significant leverage indicators that, when combined, give information about the financing structure and financial health of the bank ([Mehassouel et al., 2022](#); [Al-Badeeri, 2013](#)).

## Artificial Intelligence and Its Role in Financial Analysis and Banking Performance Evaluation

### Concept of Artificial Intelligence

The fundamental theory of artificial intelligence is based on

the fact that it is represented as a series of sophisticated technologies which focus on creating computer functionality so that machines can copy intelligent functions that are carried out by the human mind. Artificial intelligence needs a data system that will store the information and knowledge, algorithms that will determine how to use the information and programming languages that will allow one to represent the information and algorithms. With these components, the computers can be able to solve the problems and make decisions in a logical and organized way.

Another benefit of artificial intelligence is controlling operations and work with mechanisms that are more intelligent and more technologically developed than traditional processes managed by people, allowing them to conduct autonomous learning and self-development. The field of artificial intelligence is regarded to be one of the most successful in the current age since it is no longer at the research stage but rather practiced and applied commercially to show high efficiency in different areas of its implementation. It has been used extensively in business-related functions in businesses and other economic institutions such as financial and accounting functions ([Aljawder, 2016](#)).

### Artificial Intelligence Techniques and Their Use in Accounting and Auditing

Artificial intelligence is regarded as one of the most significant scientific disciplines in the modern world that includes a number of important methods that are implemented on the concepts of machine learning. The use of artificial intelligence technologies in human service is one of the primary goals that researchers and creators of this industry work on. Since communication and information systems are the key drivers of information revolution, the applied and practical facets of artificial intelligence have experienced various applications in various fields. These methods can be concluded as follows ([Othman et al., 2015](#)).

#### Expert Systems

One of the oldest and most significant methods of artificial intelligence and a kind of knowledge-based systems are expert systems. They are considered as an implementation of knowledge engineering in real world applications since they are based on databases constructed on knowledge that is gained through human specialists. This information is ready, coded, and stored in the expert system and entails rules, concepts, facts, relationships, and professional practices. These systems are then employed when required to aid in decision-making and performing tasks in a way that would best fulfill the goals set by the user as efficiently and effectively as possible ([Al-Dalameh et al., 2019](#)).

#### Artificial Neural Networks (ANNs)

Even though the existence of artificial neural networks dates back to several decades, their extensive use has just become a relatively recent event. The reasons that have enabled artificial neural networks to be more applicable on the massive scale nowadays are the growing power of computers and the big

data.

Artificial neural networks may be characterized as the method of processing that mimics the manner in which the nervous system and the human mind execute particular tasks. This method has evolved considerably due to the advances in neuroscience that have tried to comprehend the processes of the human mind in rational thinking and information processing. The artificial neural networks are based on massive parallel distributed processing consisting of simple processing units referred to as nodes or neurons ([Wang & Wang, 2016](#)).

Artificial neural networks have found a lot of applications in accounting and auditing and within the two disciplines, they have proved to be very efficient and possess high abilities compared to the conventional method of analysis.

### Fuzzy Logic

Fuzzy logic is a type of logic applied in expert systems and artificial intelligence systems. It is also known as imprecise logic, vague logic or ambiguous logic. In 1965, Lotfi Zadeh proposed the theory of fuzzy sets in which he developed fuzzy logic which was an effective means of handling data and solving complex and ambiguous problems, thus providing information to aid in making the most optimum decision.

Fuzzy logic is a model of logic which is a generalization of the binary logic so that it can be used in reasoning in case of uncertainty. It seeks with its related mathematical foundations to treat concepts of partial truth and degree of membership. Fuzzy sets are very important in fuzzy logic which has been regarded as a model logic in handling uncertain and risky problems because of its capability in modeling intricate, uncertain, or unclear information. In addition, fuzzy logic offers easy and efficient means of describing and modeling human knowledge and is practical in addressing real-life issues at a very cost-efficient level than other technologies ([Shafa, 2025](#)).

### Robots and Robotic Process Automation (RPA)

A robot refers to a machine made of metal or machinery that will allow the execution of programmed tasks under human control or controlled by computer programs. It is commonly known as an automated or humanoid machine. A robot system comprises of sensors, control systems, power supply and motion units, and software that can be used in conjunction to perform a certain task. The sensors are used to make robots perceive their environment in a similar way that humans perceive the environment but with the aid of sensing systems.

Robotic Process Automation (RPA) is a terminology that is used in reference to software that executes other application programs at the user-interface level similar to how human beings carry out their day-to-day activities. That is, RPA is also a simulation of human interaction with systems and automates repetitive routine activities to replace human labor. RPA also seeks to enhance productivity because machines are more precise, faster, and efficient in much shorter periods of time than humans. Human employees might feel fatigued, sick, or

absent, but automatic machines do not have these problems since they can work around the clock ([Al-Nawas, 2016](#)).

RPA has been viewed as one of the most versatile and efficient methods of conducting repetitive, human-oriented accounting and auditing. It is supposed to provide efficiency and effectiveness of the audit process through accomplishing tasks in a similar way as how the human auditors do but without exhaustion or boredom and conducting audit tasks in even shorter time. RPA systems are able to perform audit procedures on a significant number of audit clients in comparison to the time amount taken by a single auditor to carry out the audit of a single client. Moreover, they have the capability of minimising errors caused by data transfer and discover accounting anomalies more effectively by automated data processing and performing audit tests on volumes of accounting records ([Al-Dalameh et al., 2019](#)).

## METHODS

### Research Problem

Following the fast pace of emerging artificial intelligence technologies and the digitalization of the banking industry, there is a necessity to implement the current methods of analyzing financial data rather than adhering to the old ones, which are slow and restrict the possibilities of banks to anticipate future performance.

In this respect, the research problem can be defined with the help of the subsequent main question: To which extent does the application of AI-based financial analysis help to assess the financial performance of Iraqi banks and improve the capacity to analyze the financial indicators and determine the future performance?

### Research Significance

The importance of this study lies in its focus on a contemporary issue that integrates financial analysis with artificial intelligence within the context of a developing banking sector. Specifically, the study emphasizes the role of artificial intelligence in developing mechanisms for assessing banks' financial performance, while also providing accurate and timely analytical outputs to support decision-making in Iraqi banks. In addition, it highlights the potential of artificial intelligence to reduce reliance on traditional financial analysis methods and to facilitate alignment with ongoing digital transformation in the banking sector. Ultimately, the study contributes by offering an applied framework that can be utilized in enhancing and developing financial analysis systems in the banking industry.

### Research Objectives

This study aims to achieve several key objectives related to the integration of artificial intelligence in financial analysis within the banking sector. Specifically, it seeks to examine the effect of AI-supported financial analysis on evaluating the financial performance of Iraqi banks, as well as to measure the effectiveness of financial indicators in analyzing and interpreting banking performance. In addition, the study aims

to clarify the role of artificial intelligence techniques in predicting future financial outcomes and to enhance financial and managerial decision-making in banks through the use of intelligent financial analysis outputs.

### Research Hypotheses

This study is based on several key hypotheses concerning the role of artificial intelligence in financial analysis within the banking sector. It is hypothesized that there is a statistically significant effect of using AI-supported financial analysis on evaluating the financial performance of Iraqi banks. In addition, financial indicators are expected to contribute to explaining the efficiency of banking financial performance. The study also assumes that the use of artificial intelligence techniques enhances the ability to predict future financial performance, and that AI-supported financial analysis plays a significant role in supporting both financial and administrative decision-making within banks.

### Research Approach

The study adopts a descriptive–analytical approach, which is appropriate for its research objectives, by systematically examining theoretical concepts related to financial analysis and artificial intelligence, analyzing banks' financial data using relevant financial indicators, and applying artificial intelligence techniques to conduct data analysis and predict future financial performance.

### Research Population and Sample

The research sample includes a purposive sample of Iraqi banks, such as Mosul Bank and Middle East Bank, selected to adequately represent the population due to the availability of the financial data required for analysis.

### Data Sources

The study relies on several key data sources to ensure the accuracy and relevance of its analysis. These include the published financial statements of Iraqi banks, financial data available on the Iraq Stock Exchange, and the annual reports issued by the sample banks, all of which provide comprehensive and reliable information for evaluating financial performance and applying artificial intelligence techniques.

### Tools and Methods of Analysis

A set of analytical tools and methods was employed to achieve the objectives of the study, combining both traditional financial analysis and modern technological approaches. Specifically, the study utilizes financial ratio and indicator analysis, including capital adequacy, profitability, liquidity, activity, and leverage indicators, to evaluate banking performance comprehensively. In addition, artificial intelligence techniques are applied, particularly machine learning methods, with a focus on the linear regression algorithm to predict financial performance. Furthermore, an electronic platform is used for the analysis and processing of

financial data, enhancing the efficiency and accuracy of the analytical outcomes.

The theoretical framework of the study addressed the main groups of financial indicators mentioned above in order to establish a comprehensive conceptual framework for evaluating banking financial performance. However, the applied part of the study was limited to the financial indicators that are actually available and suitable for measurement and prediction using an AI-supported linear regression model, namely Equity to Total Assets, Return on Assets (ROA), Liquidity Ratio, and Cash to Total Assets, in line with the nature of the available data and the objectives of the study.

### Spatial and Temporal Boundaries of the Study

The study is defined by specific spatial and temporal boundaries to ensure clarity and focus in the analysis. Spatially, it is limited to Iraqi banks included in the research sample, reflecting the context of the local banking sector. Temporally, the study covers the financial years for which reliable financial data are available and deemed suitable for analysis and prediction, allowing for a consistent and meaningful evaluation of financial performance.

## RESULTS AND DISCUSSION

### Description of the Application and Study Sample

The applied part of the study aims to examine the effect of using financial analysis supported by artificial intelligence techniques in evaluating the financial performance of Iraqi banks. This is achieved through the application of an electronic platform designed to analyze financial indicators and predict future financial performance.

A sample of Iraqi banks listed on the Iraq Stock Exchange was selected, including Mosul Bank and Middle East Bank, due to the availability of the required financial data for the period under study.

### Analytical Platform Architecture

#### [\[Figure 1. Architecture of the Artificial Intelligence–Supported Analytical Platform\]](#)

[Figure 1](#), illustrates the architectural structure of the analytical platform used in the study. Financial data of the sampled banks are first entered and processed through a centralized database, after which they are analyzed using financial analysis tools and artificial intelligence techniques. This process ultimately leads to the extraction of results related to financial performance evaluation and the prediction of future financial performance.

### Data Organization and Processing for Analysis and Prediction Purposes

Financial information of the sampled banks was stored in a properly organized electronic database which guaranteed data integrity, accuracy and was readily available whenever a need arose. This helped in ensuring that a proper environment was availed in order to process financial data in a systematic

manner and apply them to determine and analyze different financial indicators in a manner that was founded on sound scientific principles. In addition, the structure of the data in a central database facilitated the implementation of financial analysis and forecasting of the financial performance in the future with the help of artificial intelligence methods, which, in turn, contributed to the improved quality of the outcomes and the credibility of the analytical result.

### Financial Indicators Used in Evaluating Financial Performance

The research depended on a series of financial indicators as quantitative measures of assessing and determining the financial performance of the sampled banks as they were capable of reflecting the efficiency of banks in using financial resources and meeting their operational and profitability goals. These indicators were determined according to the financial data obtained on the annual financial statements and served as a reference point in the evaluation of the performance of each bank in a financial perspective.

The financial indicators that were utilized in the study were of five key groups, namely capital adequacy indicators, profitability indicators, liquidity indicators, activity indicators, and leverage indicators. The indicators were used together in a holistic way so as to give the whole picture of the financial performance of banks as well as to analyze the strengths and weaknesses of the banks.

#### [\[Figure 2. Classification of Financial Indicators Used in Evaluating Banks' Financial Performance\]](#)

[Figure 2](#), illustrates the general classification of the financial indicators adopted in the study, which were used to analyze the financial performance of the sampled banks and to link their results with the processes of financial performance evaluation and the prediction of future financial performance.

### Financial Performance Prediction Model Using Artificial Intelligence

The research based on the application of artificial intelligence methods to anticipate the future financial success of the sampled banks, whereby the goal was to improve the quality of the financial analysis and help in making financial and managerial decisions. Machine learning tools were used, especially Linear Regression, which is one of the most frequently used and suitable tools to analyze financial data and determine the future trends.

The principle linear regression model is founded on the evaluation of the correlation between the independent factors expressed in the form of financial indicators and the dependent variable that indicates the financial performance of the bank based on the available historical data. The model is used to estimate the overall trend of the financial performance and is used to predict future values by use of past trend that has been observed in the data.

#### [\[Figure 3. Financial Performance Prediction Model Using](#)

#### [Linear Regression\]](#)

[Figure 3](#), illustrates the prediction model adopted in the study using the linear regression technique, where financial indicators are introduced as independent variables into the machine learning model for the purpose of predicting the future financial performance of the sampled banks.

#### [\[Table 1. Comparison of Financial Performance Indicators for the Sample Banks \(2023\)\]](#)

The comparison of the actual values and the predicted values of four major financial indicators, i.e., equity to total assets, the return on assets (ROA), the liquidity ratio and cash to total assets are presented in [Table 1](#). These indicators were chosen due to their inherent characteristics to respond to the heart of the financial performance of the sampled banks and they are in line with the objectives and methodology of the study.

The findings reveal that the actual and predicted values of the above-mentioned indicators approach each other relatively, which demonstrates the possibility of the linear regression model with the help of artificial intelligence methods to process financial data and forecast the future financial performance with the acceptable level of accuracy. In addition, these findings indicate the success of the use of financial indicators in the financial evaluation process and the significance of using intelligent financial analysis as an aiding tool in the management of banks to predict future patterns and make financial and managerial decisions on the basis of scientific foundations.

The findings in [Table 1](#) align with the research hypotheses, because they prove the presence of an impact of the application of the artificial intelligence-based financial analysis on the assessment of the financial performance of Iraqi banks, with the help of its capacity to explain the main financial indicators and forecast its future evolution. These findings also prove the hypotheses connected to the role of financial indicators in explaining the financial performance efficiency, to the role of artificial intelligence methods in improving predictive potential and contributing to financial and managerial decision-making in banks.

### Discussion of Financial Analysis and Prediction Results

The financial analysis of the sampled banks showed that the level of financial performance of banks differed, according to calculated financial indicators. Moreover, the outcomes of the prediction model based on linear regression revealed how powerful the methods of artificial intelligence can be to forecast future financial performance with a satisfactory level of accuracy as supported by the values of the coefficient of determination ( $R^2$ ).

These results suggest that financial analysis enhanced with the implementation of artificial intelligence is one such factor that is used to enhance the quality of the financial performance analysis conducted and is also a resource that helps the banking management in predicting the future trends and makes financial and managerial decisions basing on solid scientific

ground.

## CONCLUSION

The study concludes that the integration of artificial intelligence into financial analysis provides a more effective and efficient approach to evaluating the financial performance of Iraqi banks. AI-based methods enable more accurate analysis in a shorter time compared to conventional techniques, while also revealing variations in financial performance across banks through the use of different financial indicators over the observed periods. The application of the linear regression model demonstrates an acceptable level of predictive capability for future financial performance, as indicated by its coefficient of determination ( $R^2$ ). Furthermore, the use of artificial intelligence enhances the quality of financial analysis and supports decision-makers by providing reliable analytical outputs for planning and monitoring purposes. Overall, the combination of financial indicators with intelligent prediction models highlights the potential to develop more advanced and adaptive financial analysis systems in line with the demands of digital transformation in the banking sector.

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**Conflict of Interest Statement:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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**Table 1 / Comparison of Financial Performance Indicators for the Sample Banks (2023)**

| No. | Indicator              | Mosul Bank (2023) |             | Middle East Bank (2023) |             |
|-----|------------------------|-------------------|-------------|-------------------------|-------------|
|     |                        | Actual            | Predicted   | Actual                  | Predicted   |
| 1   | Equity to Total Assets | 0.357477184       | 0.275285742 | 0.373819559             | 0.401135061 |
| 2   | Return on Assets ROA)  | 0.006773419       | 0.01080102  | -0.016110344            | 0.013778467 |
| 3   | Cash to Total Assets   | 0.509988261       | 0.518893713 | 0.230776028             | 0.319177146 |
| 4   | Liquidity Ratio        | 1.279921999       | 1.380247089 | 1.351499341             | 1.375117056 |

Source: Prepared by the researcher based on the financial statements of the sample banks.

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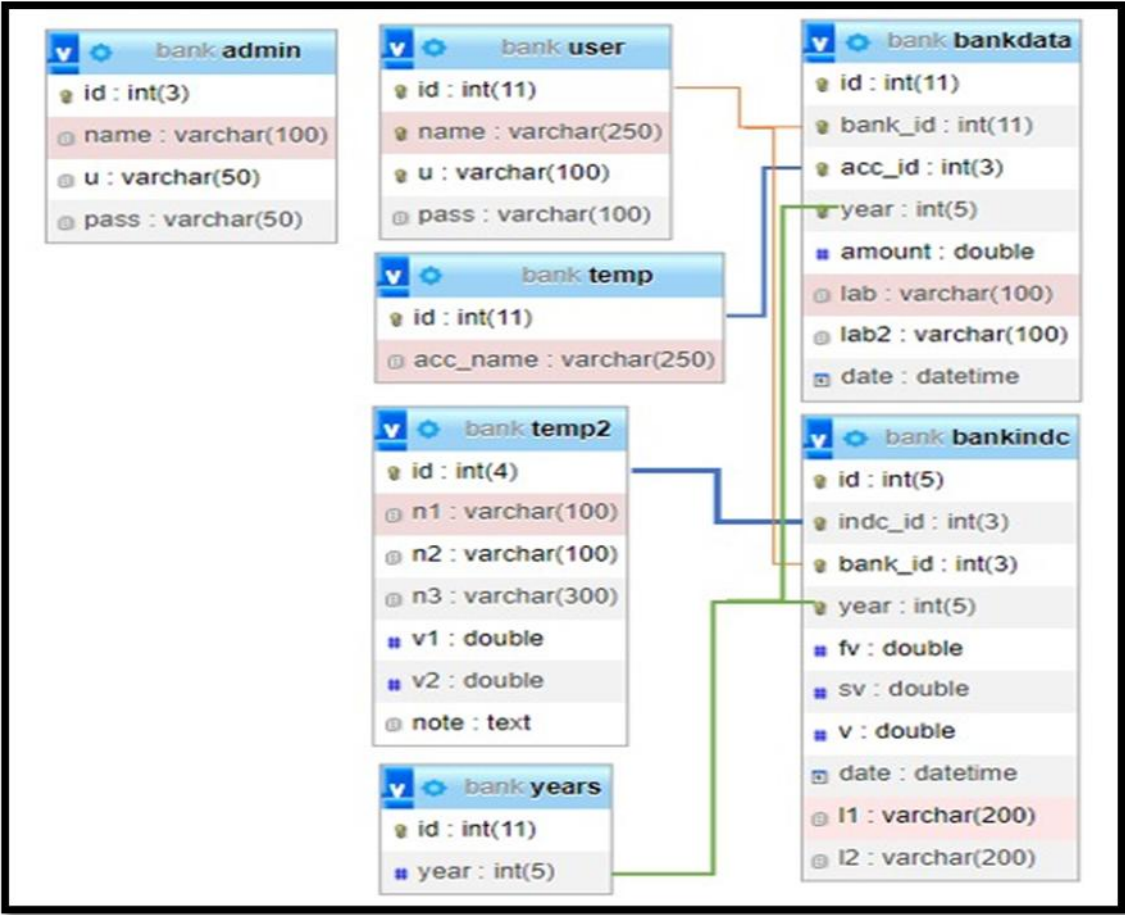
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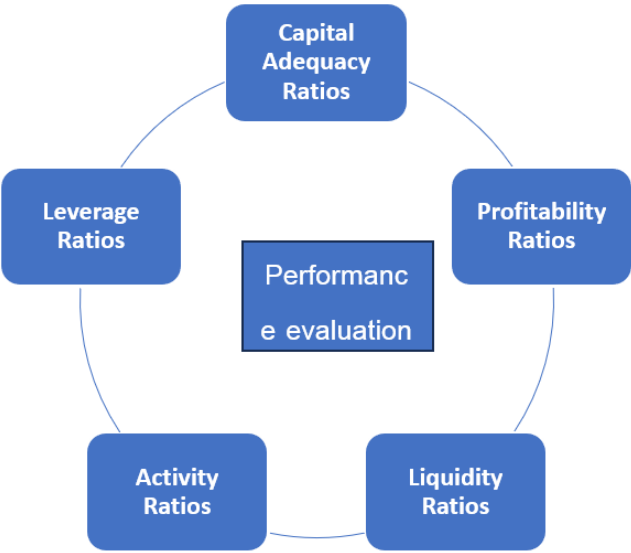
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**Figure 1** / *Architecture of the Artificial Intelligence–Supported Analytical Platform*



**Figure 2 / Classification of Financial Indicators Used in Evaluating Banks' Financial Performance**



Source: Prepared by the researcher

**Figure 3 / Financial Performance Prediction Model Using Linear Regression**