

# **DIGITAL TRANSFORMATION THROUGH *ARTIFICIAL INTELLIGENCE* : IMPLICATIONS FOR THE FINANCIAL PERFORMANCE OF THE BANKING SECTOR**

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## **Abstract**

**This study aims to analyze the influence of Artificial Intelligence (AI) implementation on the financial performance of banking companies in Indonesia. As the banking sector rapidly transforms digitally, AI is expected to enhance operational efficiency, optimize risk management, and improve financial outcomes. Understanding how AI affects profitability and return on equity is crucial for banks to remain competitive in the digital economy.**

**This research employs a quantitative approach using content analysis to assess the extent of AI application in 46 banking companies listed on the Indonesia Stock Exchange in 2024. The AI implementation is evaluated based on annual reports, and financial performance is measured through Return on Equity (ROE). Statistical analysis, including linear regression, is conducted using SPSS 27 to determine the relationship between AI and financial performance.**

**The results indicate that AI implementation has a significant and positive effect on financial performance. The regression coefficient shows that each unit increase in AI adoption improves ROE by 5.744 units, and the significance value ( $p = 0.002$ ) confirms a strong statistical relationship. These findings suggest that integrating AI into core banking operations can be a strategic lever to boost profitability.**

**Keywords:** *Artificial Intelligence, Financial Performance, Banking*



and optimize risk management. One of the main advantages of the application of AI in the banking sector is its ability to improve risk management. A study by Davenport (2019) revealed that AI allows banks to be more effective in predicting credit and market risks. With the ability to analyze large amounts of data, AI can help banks to make smarter decisions related to lending, financing, and investments.

While there are many potential benefits of implementing AI, some studies have also noted the challenges that may arise. Jagtiani and Lemieux (2018) reveal that AI adoption requires a large initial investment in terms of hardware, software, and human resource training. In addition, issues related to data security and customer privacy are also a major concern in the application of this technology. Research by Binns (2018) also warns that the use of inappropriate or less transparent AI can lead to customer distrust and a negative impact on the bank's reputation.

Using bibliometric data analyzed through *VosViewer*, this study will provide insights into the latest trends in the application of AI in banking, as well as identify the factors influencing the success of AI implementation in the sector. Based on previous studies and analysis conducted with *VosViewer*, it can be concluded that digital transformation through AI has a significant impact on the financial performance of companies in the banking sector. This research aims to broaden the understanding of these impacts, by delving deeper into how the application of AI can affect financial performance, both in terms of revenue, cost, and risk.

This research will make an important contribution to the understanding of the impact of AI on banking financial performance, as well as provide useful information for decision-makers in the banking sector to plan and execute more effective digital transformation strategies.

## ***1.2 Problem Formulation***

In the rapidly growing digital era, artificial intelligence technology has become one of the main drivers in various sectors, including the banking sector. Digital transformation through AI has great potential to change the way banks operate, starting from customer service and other internal processes. However, these changes also pose challenges related to how the application of AI can affect the overall financial performance of banking companies, the formulation of the problem of this study is:

1. How can the application of *Artificial Intelligence* (AI) technology in the banking sector affect the financial performance of banking companies?
2. What are the factors that affect the success of digital transformation through *Artificial Intelligence* (AI) in improving banking financial performance?
3. How can digital transformation through *Artificial Intelligence* (AI) contribute to increasing the financial profitability of banks?

The formulation of this problem aims to delve deeper into the impact of digital transformation through AI on banks' financial performance, as well as to analyze the factors that support or hinder the implementation of the technology.

### ***1.3 Research Objectives***

The application of *Artificial Intelligence* (AI) technology in the banking sector is becoming increasingly important along with the development of digital transformation. The use of AI is expected to improve operational efficiency, optimize risk management, and provide added value for customer service. In addition, AI is expected to have a positive impact on banks' financial performance, especially in terms of profitability and financial stability. This study aims to examine how the application of AI can affect the financial performance of banks as well as the factors that affect the success of digital transformation through AI.

Research Objectives:

1. To analyze the influence of the application of *Artificial Intelligence* (AI) technology in the banking sector on the financial performance of banking companies.
2. To identify the factors that affect the success of digital transformation through AI in the banking sector, as well as its impact on the bank's financial performance.
3. To evaluate the contribution of digital transformation through AI to increasing the financial profitability of banks.

### ***1.4 Research Benefits***

The application of *Artificial Intelligence* (AI) in the banking sector has great potential to improve operational efficiency and bank profitability. Digital transformation through AI not only optimizes customer service but also affects the financial aspects of the company, including in terms of risk management and increased profitability. This research aims to provide a deeper understanding of the impact of AI on banks' financial performance and the factors influencing the success of digital transformation in the banking sector. With the results of this research, it is hoped that it can make an important contribution to practices and policies in the banking sector.

1. Providing insights into the impact of the application of *Artificial Intelligence* (AI) technology on the financial performance of banking companies, which can be a reference for decision-makers in the banking sector to further optimize this technology.
2. Provide information on the factors influencing the success of digital transformation through AI, so that banks can improve implementation and accelerate the adoption of effective AI technology to support their financial performance.

3. Contribute to improving understanding of how AI can contribute to bank profitability, which can assist banks in formulating strategies to improve profits and financial stability through the use of advanced technology.
4. Provide practical recommendations for managers in the banking sector to plan and implement AI technology more strategically to create sustainable financial profits.

## **2. Literature Review**

### **2.1 Digital Transformation in the Banking Sector**

Digital transformation is a fundamental change in an organization caused by the adoption of digital technology to increase efficiency and productivity. In the context of banking, digital transformation refers to the use of new technologies to improve operations, services, and customer experiences. Digital banking has become a global trend, where banks seek to leverage technology to optimize their services, minimize operational costs, and improve security and risk management systems (Binns, 2018).

A relevant theory to explain this phenomenon is the Innovation Diffusion Theory (Rogers, 2003). This theory posits that the adoption of new innovations, such as digital technologies, takes place through different stages in an organization. Banks as an organization must be able to face the challenges of adopting new technologies, taking into account factors such as complexity, compatibility, and social influence on technology adoption decisions.

### **2.2 Artificial Intelligence (AI) in the Banking Sector**

Artificial intelligence (AI) is one of the technologies with the most potential to transform the banking sector. AI can be used for a variety of applications such as business process automation, risk prediction, customer service personalization, as well as large amounts of data analysis to support decision-making (Davenport, 2019).

Information Systems Theory (Laudon, 2020) explains that the application of information technology, including AI, can have a major impact on organizational performance. Information technology, through the use of AI, acts as an enabler that changes the way organizations operate and interact with customers and partners. AI enables more efficient data processing, provides more accurate data-driven recommendations, and improves responsiveness to customer needs.

### **2.3 The Impact of AI on Banking Financial Performance**

The banking sector can benefit from the adoption of AI, especially in terms of risk management and improved operational efficiency. A study by Davenport (2019) shows that AI allows banks to be more accurate in predicting market and credit risks, as well as provide better decisions related to lending and investment. In addition, AI can improve the

personalization of the services provided to customers, which has the potential to increase customer loyalty and bank profitability.

Value Chain Theory (Porter, 1985) posits that the use of information technology, including AI, can improve efficiency at various stages of a company's value chain. In banking, AI has the potential to improve efficiency in several key activities, such as risk management, customer service, and financial decision-making. This can improve the bank's financial performance by reducing costs and increasing revenue.

#### 2.4 Challenges of Implementing AI in Banking

While there are many advantages to the application of AI, some significant challenges also arise. Jagtiani and Lemieux (2018) reveal that AI adoption requires a large investment in hardware and software, as well as adequate training of human resources. Issues related to data security and customer privacy are also a major concern. Therefore, the implementation of AI requires the right strategy in managing resources and ensuring compliance with applicable regulations.

Change Management Theory (Kotter, 1996) can be applied to understand the challenges faced by banks in implementing AI. A successful change process requires commitment from top management, effective communication, and the involvement of all employees in the change process. This is particularly relevant in the context of the implementation of AI technology, where banks must manage technological changes well to ensure successful implementation.

#### 2.5 Factors Influencing the Success of AI Implementation

The success of AI implementation in the banking sector is greatly influenced by several factors, including organizational readiness, human resource competence, and supporting technology infrastructure. Research by Binns (2018) shows that organizational culture factors that are open to technological change also affect the success of AI implementation. Additionally, the bank's ability to adapt quickly to technological changes is also important to ensure successful adoption.

Resource and Capability Theory (Barney, 1991) states that success in implementing new technologies, including AI, depends on the quality of the resources that the organization has, such as technology, human skills, and existing managerial systems. Therefore, banks that have better resources and higher capabilities in managing digital technology will be more successful in implementing AI and improving their financial performance.

#### 2.6 Implications of Digital Transformation on Banking Profitability

Digital transformation through AI has great potential to increase banking profitability. With more efficient business process automation and data processing, banks can reduce operational costs and increase revenue from more personalized and efficient services.

Predictive analytics that use AI can also help banks to identify new business opportunities and mitigate risks that could threaten profitability.

The Theory of Competitive Advantage (Porter, 1985) states that technology can be a source of sustained competitive advantage, provided that companies can make better use of the technology than competitors. In the context of banking, the proper application of AI can be a significant source of competitive advantage, as it can improve efficiency, risk management, as well as the quality of customer service which in turn increases profitability.

This literature review shows that the application of AI in the banking sector has a significant impact on financial performance. AI can improve operational efficiency, improve risk management, and improve customer service, leading to increased bank profitability. Nonetheless, the challenges associated with large initial investments, data security, and customer privacy must be managed with care. Factors such as organizational readiness and human resources also affect the success of AI implementation in the banking sector.

## 2.7 Previous Research

Table 1. Previous Research

| No. | Writer                    | Year | Research Title   | Research Focus  | Key Findings  |
|-----|---------------------------|------|--|---|---|
| 1   | Davenport (2019)          | 2019 | Artificial Intelligence in Banking: A New Frontier for Risk Management | Application of AI in banking risk management  | AI helps in credit and market risk prediction, improving bank decision-making                               |
| 2   | Jagtiani & Lemieux (2018) | 2018 | The Role of Artificial Intelligence in Banking: A Double-Edged Sword?  | The influence of AI in the banking sector and the challenges of technology adoption | Challenges in AI adoption include large initial investments and data security and customer privacy concerns |
| 3   | Binns (2018)              | 2018 | AI Adoption in Banking: A Trust Dilemma?                               | The impact of customer distrust on the use of AI in banking                         | Less transparent use of AI can damage banks' reputations and reduce customer trust                          |
| 4   | Kumar & Raj (2020)        | 2020 | The Impact of Digital Transformation on the Financial                  | Digital transformation and its impact on  | Digital transformation, including AI, improves  |

| No. | Writer                   | Year | Research Title  | Research Focus   | Key Findings  |
|-----|--------------------------|------|---|--|---|
|     |                          |      | Performance of Banks  | banks' financial performance   | bank efficiency and profitability   |
| 5   | Chatterjee et al. (2021) | 2021 | AI and Digital Banking: How Artificial Intelligence is Reshaping Banking Operations                   | The use of AI in banking operations  | AI accelerates service automation and improves customer experience  |
| 6   | Mikalef et al. (2019)    | 2019 | Artificial Intelligence in Banking: A Comprehensive Review of Benefits and Challenges                 | Review of the advantages and challenges of applying AI in the banking sector | AI helps in operational efficiency but there are challenges in implementation and the cost of investment in technology  |
| 7   | Singh et al. (2020)      | 2020 | Transforming Banking Operations with AI: Opportunities and Risks                                      | Opportunities and risks of AI adoption in the banking sector                 | AI enhances security, but there are risks associated with data protection and privacy policies  |
| 8   | Finkenwirth, A.          | 2021 | Exploring the Impact of Digital Transformation on Financial Services                                  | The impact of digital transformation on financial services                   | Digital transformation improves operational efficiency and accelerates innovation in financial services, but presents challenges related to security and regulatory compliance. |
| 9   | Zeng et al. (2020)       | 2020 | Artificial Intelligence and Financial Risk: Exploring the Role of Machine Learning in Risk Management | The role of machine learning in financial risk management in banking         | Machine learning can improve the ability to predict risk and manage banks' investment portfolios  |

| No. | Writer                    | Year | Research Title  | Research Focus   | Key Findings   |
|-----|---------------------------|------|---|--|--|
| 10  | Full Moons & Agung (2022) | 2022 | The Effectiveness of AI in Financial Services: A Case Study of Indonesian Banks | Case study of the application of AI in the Indonesian banking sector | The implementation of AI in Indonesian banks shows improved customer service and operational efficiency despite major challenges |

Source: (data processed, 2025)

## 2.8 Research Framework

This research framework will explain how the application of AI can improve banks' financial performance. The research framework is described in Figure. 2

Figure 2. Research Framework



Source: (data processed, 2025)

## 2.9 Hypothesis

Hypothesis testing is a statistical method used to test certain statements or assumptions about population parameters based on sample data. This process involves comparing the zero hypothesis ( $H_0$ ) and the alternative hypothesis ( $H_1$ ) to determine which one is more appropriate with the data. Based on the research framework, the hypothesis test can be formulated as follows:

- **Hypothesis Zero ( $H_0$ ):** There is no significant relationship between *Artificial Intelligence* ( $X_1$ ) and the financial performance ( $Y$ ) of a company.
- **Alternative Hypothesis ( $H_1$ ):** There is a significant relationship between *Artificial Intelligence* ( $X_1$ ) and the financial performance ( $Y$ ) of a company.

## 3. Materials and Methods

### 3.1 Types of Research and Approaches

This study uses a type of quantitative research. This type of research was chosen because the purpose of the research is to measure and analyze the influence or relationship between existing variables, namely the influence of *Artificial Intelligence* on the financial performance of the banking sector.

Quantitative research is suitable for use in this study because it can produce data in the form of numbers that can be processed using statistics to test hypotheses and draw conclusions that can be generalized to a wider population, both independent variables (*Artificial Intelligence*) and dependent variables (*Financial Performance*) can be measured numerically. For example, the adoption of AI can be measured based on the level of use of AI technology, while financial performance can be measured through various metrics such as *Return On Equity* (ROE).

The approach used in this study is most likely correlational research. This is because this study seeks to identify the extent to which there is a relationship or correlation between AI variables and financial performance variables. Correlation research aims to measure the strength and direction of the relationship between two or more variables.

## **3.2 Population and Sample**

### **3.2.1 Population**

The population in this study is all banking sector companies listed on the Indonesia Stock Exchange (IDX). By limiting the population to banking companies listed on the IDX, researchers can ensure that the companies studied have relatively homogeneous characteristics, such as being subject to the same regulations and having access to the capital market. Here are the reasons why you choose a banking sector company listed on the IDX:

- **Available Data:** Companies listed on the IDX are required to publish financial statements on a regular basis. This financial data is essential for measuring a company's financial performance.
- **Transparency:** Public companies generally have a higher level of transparency than private companies. This makes it easier for researchers to obtain accurate and relevant data.
- **Representative:** Companies listed on the IDX are representatives of the broader banking industry in Indonesia. The results of the research obtained from this population can be generalized to larger populations.
- **Innovation:** The banking sector is known to be one of the fastest sectors to adopt new technologies, including AI. Therefore, banking companies listed on the IDX tend to be pioneers in the application of AI.

Selecting the right population is crucial in a study. By selecting banking sector

companies listed on the IDX as a population, this research has the potential to make a significant contribution to the development of science and business practices, particularly in the context of the application of AI in the financial sector.

### 3.2.2 Samples

The research sample was taken from the population of banking sector companies listed on the IDX. The number of samples used was 46 companies. The following are the measurements of the variables in the study:

Table 2. Research Sample

| Aspects               | Information   |
|-----------------------|---|
| Research Sample       | The sample was taken from the population of banking sector companies listed on the IDX. The sample count is 46 companies.   |
| Sample Considerations | <ul style="list-style-type: none"> <li>• Representativeness: The sample represents the population of banking companies listed on the IDX.</li> <li>• Data Availability: Companies listed on the IDX publish annual reports, so data on AI application and financial performance is available.</li> </ul>  |
| Independent Variables | Application of AI ( <i>Artificial Intelligence</i> )  |
| Measurement Method    | <i>Content analysis</i> in the company's annual report for 2024.  |
| Indicator             | <ul style="list-style-type: none"> <li>• The existence of an explanation of AI in the annual report.</li> <li>• The use of AI-related terms (e.g., <i>machine learning</i>, <i>deep learning</i>, <i>artificial intelligence</i>).</li> <li>• A description of the application of AI in business aspects (e.g., data analysis, customer service, product development).</li> </ul> |
| Scoring               | <ul style="list-style-type: none"> <li>• If the annual report mentions AI, it is given a score of 1.</li> <li>• If there is no mention of AI, a score of 0 is given.</li> </ul>   |
| Variable Dependency   | Financial Performance ( <i>Return on Equity</i> )   |

| Aspects           | Information   |
|-------------------|---|
| Indicator         | <i>Return on Equity</i> (ROE) period 2024.  |
| Definition of ROE | The ratio of net income to total equity in 2024. ROE indicates the company's efficiency in generating profits from shareholder capital. |

Source: (data processed, 2025)

This research is a good first step to understand the relationship between the application of AI and financial performance in the Indonesian banking sector. Using ROE data for 2024, this study tries to capture the medium-term effects of the implementation of AI that has started since 2024.

### 3.2 Data collection techniques

The data collection technique in this study uses purposive sampling, that is, a sampling technique that is carried out by selecting research subjects based on certain criteria that are relevant to the research objectives. This technique is often used in both quantitative and qualitative research, especially when the population is large and not all population elements are relevant for the research. Here are the reasons why choose purposive sampling:

#### 1. Special Criteria for Research Samples

- This research requires specific data from banking companies listed on the Indonesia Stock Exchange (IDX), because only these companies are required to publish annual reports.
- Annual reports are the main source for content analysis regarding the application of *Artificial Intelligence* (AI) and financial performance measurement (*Return on Equity* or ROE).

#### 2. Focus on Representativeness

- Purposive sampling allows researchers to select the most representative sample of a population that has certain characteristics. In this case, representativeness is a banking company on the IDX that uses AI, as well as has relevant data to analyze.

#### 3. Efficiency in Data Collection

- Not all banking companies on the IDX may have annual reports that list the application of AI. With purposive sampling, researchers can save time and resources by focusing only on companies that meet the criteria.

Purposive sampling is the most suitable technique for this study because it allows researchers to select samples based on criteria relevant to the research objectives, such as representativeness, data availability, and relevance of AI application. This technique ensures the efficiency of data collection and valid results to analyze the relationship between AI application and financial performance in the banking sector.

### 3.3 Data Analysis Techniques

The data analysis in this study using SPSS (*Statistical Package for the Social Sciences*) software is very popular in statistical, social, and business research.

#### a. Descriptive Analysis

Descriptive Analysis is a statistical method that aims to describe the characteristics or distribution of data without making inferences (conclusions) about the wider population. In this analysis, the researcher uses SPSS (*Statistical Package for the Social Sciences*), this analysis is carried out by utilizing basic statistical features to facilitate interpretation which has the following main functions:

- Provides an overview of the data in the form of simple statistics.
- Presenting data systematically using tables, graphs, or statistical figures.
- Provides a basis for advanced statistical analysis.

The purpose of descriptive analysis is to analyze the distribution of data on each variable with the following techniques:

- Frequency: Look at the number of FinTech users, financial literacy levels, and financial inclusion.
- Mean and Standard Deviation: Measures the general rate and variation of the data.

#### b. Correlation Test

Correlation testing is a statistical analysis method used to measure the relationship between two or more variables. This test aims to find out if there is a significant relationship, how strong the relationship is, and the direction of the relationship (positive or negative). Correlation does not show a cause-and-effect relationship, but only a relationship or association between variables. Types of correlation tests:

##### 1. Korelasi Pearson (*Pearson Product-Moment Correlation*):

- Used to measure the linear relationship between two variables, scaled intervals or ratios.
- The correlation value is expressed by **the Pearson correlation coefficient (r)**,

which ranges from -1 to 1.

- $r > 0$  : Positive relationship (if one variable goes up, the other variable tends to go up).
- $r < 0$  : Negative relationship (if one variable goes up, the other variable tends to go down).
- $r = 0$  : No relationship.

## 2. Korelasi Spearman (*Spearman's Rank Correlation*):

- It is used to measure the relationship between ordinal variables or data that is not normally distributed.
- Use data ratings to calculate relationships.

## c. Multiple Regression Test

Multiple regression testing is a statistical analysis used to study the relationship between one dependent variable (bound) and two or more independent (independent) variables. This model helps to understand the extent to which independent variables affect dependent variables simultaneously and partially. Objectives of multiple regression test:

1. Describe the relationship between independent variables and dependent variables.
2. Predict the value of dependent variables based on independent variables.
3. To test the significant influence of independent variables on dependent variables either partially or simultaneously.

Multiple regression equations can be written as follows:

$$Y = a + b_1 X_1 + b_2 X_2 + \dots + b_n X_n + \varepsilon$$

Where:

- $Y$  : Variable dependency
- $X_1, X_2, \dots, X_n$  : Independent variable
- $a$  : Constant (intersep)
- $B_1, B_2, \dots, B_n$  : The regression coefficient for each independent variable
- $\varepsilon$  : Error (residue)

Steps of multiple regression test:

1. Data Collection
  - Collect data for dependent and independent variables.
2. Classic Assumption Test (for classic linear data):
  - Normality: Residual should be normally distributed.
  - Multicollinearity: There is no strong relationship between independent variables.
  - Autocorrelation: Residuals should not be correlated with each other.
  - Homoskedasticity: The residual variance must be constant.
3. Estimasi Model
  - Using *the ordinary least squares* (OLS) method to calculate the regression coefficient.
4. Uji Hypothesis:
  - Test F: Tests whether all independent variables simultaneously have a significant effect on the dependent variables.
  - t-test: Tests whether each independent variable has a significant effect on the dependent variable.
  - Coefficient of Determination (R<sup>2</sup>): Assesses how well the model explains variations in data.
5. Interpretation and Conclusion  
Interpret regression coefficients and conclusions from statistical tests.

## 4.1. Data Description

### 4.1.1 Independent Variables

- Application of AI (*Artificial Intelligence*)

Table 3 Application of AI (*Artificial Intelligence*) for the 2024 Period

| No | Bank                          | Using AI      | Ket. |
|----|-------------------------------|---------------|------|
| 1  | PT Bank Raya Indonesia Tbk    | Not Available | 0    |
| 2  | PT Bank IBK Indonesia Tbk     | Not Available | 0    |
| 3  | PT Bank Amar Indonesia Tbk    | Not Available | 0    |
| 4  | PT Bank Jago Tbk              | Ya            | 1    |
| 5  | PT Bank MNC Internasional Tbk | Not Available | 0    |

| <b>No</b> | <b>Bank</b>                               | <b>Using AI</b> | <b>Ket.</b> |
|-----------|---|-----------------|-------------|
| 6         | PT Bank Capital Indonesia Tbk             | Not Available   | 0           |
| 7         | PT Bank Aladin Syariah Tbk                | Ya              | 1           |
| 8         | PT Bank Central Asia Tbk                  | Ya              | 1           |
| 9         | PT Allo Bank Indonesia Tbk                | Ya              | 1           |
| 10        | PT Bank KB Bukopin Tbk                    | Ya              | 1           |
| 11        | PT Bank Mestika Dharma Tbk                | Not Available   | 0           |
| 12        | PT Bank Negara Indonesia (Persero) Tbk    | Ya              | 1           |
| 13        | PT Bank Rakyat Indonesia (Persero) Tbk    | Ya              | 1           |
| 14        | PT Bank Tabungan Negara (Persero) Tbk     | Ya              | 1           |
| 15        | PT Bank Neo Commerce Tbk                  | Not Available   | 0           |
| 16        | PT Bank Jtrust Indonesia Tbk              | Not Available   | 0           |
| 17        | PT Bank Danamon Indonesia Tbk             | Ya              | 1           |
| 18        | PT Bank Pembangunan Daerah Banten Tbk     | Not Available   | 0           |
| 19        | PT Bank Ganesha Tbk                       | Not Available   | 0           |
| 20        | PT Bank Ina Perdana Tbk                   | Not Available   | 0           |
| 21        | PT Bank Pembangunan Daerah Jawa Barat Tbk | Ya              | 1           |
| 22        | PT Bank Pembangunan Daerah Jawa Timur Tbk | Ya              | 1           |
| 23        | PT Bank QNB Indonesia Tbk                 | Not Available   | 0           |
| 24        | PT Bank Maspion Indonesia Tbk             | Not Available   | 0           |
| 25        | PT Bank Mandiri (Persero) Tbk             | Ya              | 1           |
| 26        | PT Bank Bumi Arta Tbk                     | Not Available   | 0           |
| 27        | PT Bank CIMB Niaga Tbk                    | Ya              | 1           |
| 28        | PT Bank Maybank Indonesia Tbk             | Ya              | 1           |

| No | Bank  | Using AI      | Ket. |
|----|---|---------------|------|
| 29 | PT Bank Permata Tbk                           | Ya            | 1    |
| 30 | PT Bank Syariah Indonesia Tbk                 | Ya            | 1    |
| 31 | PT Bank Sinarmas Tbk                          | Ya            | 1    |
| 32 | PT Bank of India Indonesia Tbk                | Not Available | 0    |
| 33 | PT Bank BTPN Tbk                              | Ya            | 1    |
| 34 | PT Bank BTPN Syariah Tbk                      | Ya            | 1    |
| 35 | PT Bank Victoria International Tbk            | Ya            | 1    |
| 36 | PT Bank Oke Indonesia Tbk                     | Not Available | 0    |
| 37 | PT Bank Artha Graha Internasional Tbk         | Not Available | 0    |
| 38 | PT Bank Multiarta Sentosa Tbk                 | Not Available | 0    |
| 39 | PT Bank Mayapada Internasional Tbk            | Not Available | 0    |
| 40 | PT Bank China Construction Bank Indonesia Tbk | Not Available | 0    |
| 41 | PT Bank Mega Tbk                              | Ya            | 1    |
| 42 | PT Bank OCBC NISP Tbk                         | Ya            | 1    |
| 43 | PT Bank Nationalnobu Tbk                      | Not Available | 0    |
| 44 | PT Bank Pan Indonesia Tbk                     | Not Available | 0    |
| 45 | PT Bank Panin Dubai Syariah Tbk               | Ya            | 1    |
| 46 | PT Bank Woori Saudara Indonesia 1906 Tbk      | Ya            | 1    |

Source; Data Processed by the Indonesia Stock Exchange (2024)

Table 3 shows a list of 46 banks with information columns related to the use of AI, where there are "Yes" (using AI) and "Not Available" (information not available). Of the total 46 banks listed in the table:

- 23 banks use AI explicitly.

- 23 banks have information that is not available regarding the use of AI.

This reflects that the use of AI in the banking sector has been significantly adopted, especially by large and well-known banks, such as PT Bank Central Asia Tbk, PT Bank Mandiri Tbk, and PT Bank Rakyat Indonesia Tbk. However, there are also some banks, especially smaller or specific ones, where information related to the use of AI is not yet available or has not been publicly announced. The use of AI by these banks shows an increasingly important direction of digital transformation in improving customer service, operational efficiency, and competitiveness in the banking sector.

#### 4.1.1 Variable Dependency

- *Return On Equity (ROE)*

Table 4 *Return On Equity (ROE) Period 2024*

| No | Bank                                   | Return on Equity |
|----|--|------------------|
| 1  | PT Bank Raya Indonesia Tbk             | 1,41%            |
| 2  | PT Bank IBK Indonesia Tbk              | 4,97%            |
| 3  | PT Bank Amar Indonesia Tbk             | 6,24%            |
| 4  | PT Bank Jago Tbk                       | 1,02%            |
| 5  | PT Bank MNC Internasional Tbk          | 1,99%            |
| 6  | PT Bank Capital Indonesia Tbk          | 2,85%            |
| 7  | PT Bank Aladin Syariah Tbk             | -2,54%           |
| 8  | PT Bank Central Asia Tbk               | 22,88%           |
| 9  | PT Allo Bank Indonesia Tbk             | 6,18%            |
| 10 | PT Bank KB Bukopin Tbk                 | 15,08%           |
| 11 | PT Bank Mestika Dharma Tbk             | 6,10%            |
| 12 | PT Bank Negara Indonesia (Persero) Tbk | 16,28%           |
| 13 | PT Bank Rakyat Indonesia (Persero) Tbk | 19,53%           |
| 14 | PT Bank Tabungan Negara (Persero) Tbk  | 7,37%            |
| 15 | PT Bank Neo Commerce Tbk               | 1,13%            |

|           |   |                         |
|-----------|---|-------------------------|
| 16        | PT Bank Jtrust Indonesia Tbk              | 6,94%                   |
| 17        | PT Bank Danamon Indonesia Tbk             | 7,02%                   |
| 18        | PT Bank Pembangunan Daerah Banten Tbk     | 0,93%                   |
| 19        | PT Bank Ganesha Tbk                       | 5,57%                   |
| 20        | PT Bank Ina Perdana Tbk                   | 4,56%                   |
| 21        | PT Bank Pembangunan Daerah Jawa Barat Tbk | 10,24%                  |
| 22        | PT Bank Pembangunan Daerah Jawa Timur Tbk | 10,21%                  |
| 23        | PT Bank QNB Indonesia Tbk                 | 1,46%                   |
| <b>No</b> | <b>Bank</b>                               | <b>Return on Equity</b> |
| 24        | PT Bank Maspion Indonesia Tbk             | 0,82%                   |
| 25        | PT Bank Mandiri (Persero) Tbk             | 23,20%                  |
| 26        | PT Bank Bumi Arta Tbk                     | 1,80%                   |
| 27        | PT Bank CIMB Niaga Tbk                    | 13,59%                  |
| 28        | PT Bank Maybank Indonesia Tbk             | 5,77%                   |
| 29        | PT Bank Permata Tbk                       | 12,16%                  |
| 30        | PT Bank Syariah Indonesia Tbk             | 17,59%                  |
| 31        | PT Bank Sinarmas Tbk                      | 2,63%                   |
| 32        | PT Bank of India Indonesia Tbk            | 2,02%                   |
| 33        | PT Bank BTPN Tbk                          | 3,71%                   |
| 34        | PT Bank BTPN Syariah Tbk                  | 13,77%                  |
| 35        | PT Bank Victoria International Tbk        | 2,63%                   |
| 36        | PT Bank Oke Indonesia Tbk                 | 1,00%                   |
| 37        | PT Bank Artha Graha Internasional Tbk     | 16,53%                  |
| 38        | PT Bank Multiarta Sentosa Tbk             | 4,54%                   |

|    |   |        |
|----|---|--------|
| 39 | PT Bank Mayapada Internasional Tbk            | 0,49%  |
| 40 | PT Bank China Construction Bank Indonesia Tbk | 3,27%  |
| 41 | PT Bank Mega Tbk                              | 5,51%  |
| 42 | PT Bank OCBC NISP Tbk                         | 14,65% |
| 43 | PT Bank Nationalnobu Tbk                      | 9,43%  |
| 44 | PT Bank Pan Indonesia Tbk                     | 4,52%  |
| 45 | PT Bank Panin Dubai Syariah Tbk               | 5,09%  |
| 46 | PT Bank Woori Saudara Indonesia 1906 Tbk      | 0,91%  |

Source; Data Processed by the Indonesia Stock Exchange (2024)

Based on data, *Return on Equity* (ROE) is an important indicator that shows how efficiently a company, in this case a bank, uses its equity capital to generate profits. The higher the ROE, the better the bank's performance. Banks with ROE above 15%, such as PT Bank Mandiri (Persero) Tbk, PT Bank Central Asia Tbk, and PT Bank Rakyat Indonesia (Persero) Tbk, show highly efficient and highly competitive capital management. These banks tend to have a broad customer base, diverse products, and a strong operational strategy. Banks with low ROE have the potential to improve operational efficiency and profitability through digitalization, product diversification, or cost efficiency.

Banks that experienced negative ROE, such as PT Bank Aladin Syariah Tbk, faced serious challenges in generating profits. This may be due to high operational costs or fierce competition in the banking sector. Banks that leverage technology, including AI, tend to have a greater chance of improving operational efficiency and profitability, which can ultimately be reflected in increased ROE.

From the data presented, it can be seen that there is a significant difference in performance among banks in Indonesia. Large and reputable banks tend to have high ROEs, indicating superior capital management. However, many other banks are still struggling to improve their efficiency and profitability. Digitalization, product innovation, and effective cost management are key to improving future performance.

## 4.2. Data Analysis

### 4.2.1 Descriptive Analysis

Descriptive Analysis is a statistical method used to describe, summarize, and organize data in a systematic manner to make it easier to understand. In descriptive analysis, the main

focus is on measuring and interpreting the characteristics of the data without making broader inferences or conclusions. It aims to provide a clear picture of the distribution of data and help understand existing patterns. The following is a table showing the descriptive analysis in this study:

Table 5 Statistical Descriptive Analysis

| Descriptive Statistics       |           |           |           |           |           |           |            |                |           |           |            |           |            |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|----------------|-----------|-----------|------------|-----------|------------|
|                              | N         | Range     | Minimum   | Maximum   | Sum       | Mean      |            | Std. Deviation | Variance  | Skewness  |            | Kurtosis  |            |
|                              | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic      | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Kinerja Keuangan (ROE)       | 46        | 25.74     | -2.54     | 23.20     | 323.05    | 7.0228    | .94069     | 6.38009        | 40.706    | .997      | .350       | .167      | .688       |
| Artificial Intelligence (AI) | 46        | 1         | 0         | 1         | 24        | .52       | .074       | .505           | .255      | -.090     | .350       | -2.085    | .688       |
| Valid N (listwise)           | 46        |           |           |           |           |           |            |                |           |           |            |           |            |

Source : Data Processed SPSS 27 (2024)

This table presents a summary of basic statistics of two variables: Financial Performance (ROE) and Artificial *Intelligence* (AI) Usage.

### 1. Financial Performance (ROE)

- Range: ROE values vary quite widely, from -2.54 to 23.20. This shows a significant difference in the financial performance of the company studied.
- Mean: The average ROE value is 7.02. This means that, overall, the companies in the sample have moderate financial performance.
- Standard Deviation: A fairly high standard deviation value (6.38) indicates a fairly wide spread of data. This means that the ROE values of the companies in the sample vary widely, not just gathering around the average.
- Skewness: A positive skewness value (0.997) indicates that the distribution of ROE data tends to be skewed to the right (positive). This means that there are more companies with low ROE values compared to companies with very high ROE values.
- Kurtosis: A positive kurtosis value (0.167) indicates a slightly more "pointed" distribution of ROE data compared to the normal distribution. However, this value is still relatively close to 0, so it can be said that the distribution of ROE data is still quite close to normal.

Based on the above statistics, it can be concluded that the financial performance of the companies in the sample varies greatly. Most companies have moderate to low financial performance, with only a few having excellent financial performance. These variations in financial performance may be caused by various factors, such as industry differences, company size, business strategies, and different economic conditions.

### 2. Use of Artificial Intelligence (AI)

- Range: The AI value has only two possibilities, which are 0 (not using AI) or 1 (using AI).
- Mean: The average AI value is 0.52. This means that about 52% of the companies in the sample use AI, while the rest do not use AI.

The use of AI in sample companies is still relatively low. This shows that the adoption of AI technology in the sectors studied is still not widespread. Overall, this descriptive statistical table provides valuable information about the distribution of financial performance data and the use of AI in the sample studied. However, to gain a more comprehensive understanding, advanced statistical analysis is needed that can reveal the relationship between these variables.

#### 4. 2.2 Analysis of the Return of the Line

Linear *regression* is a statistical method used to analyze the relationship between a dependent variable (bound) and an independent variable (free). The main purpose of linear regression is to model the linear relationships that exist between dependent variables and independent variables, so that they can be used for prediction or to understand the influence of independent variables on dependent variables.

Classical assumption tests are performed first before linear regression analysis to ensure that the constructed model is valid and the results are reliable. If the assumptions underlying linear regression are not met, then the results of the regression analysis may be biased, inaccurate, or cannot be interpreted correctly.

##### a. Classical Assumption Test

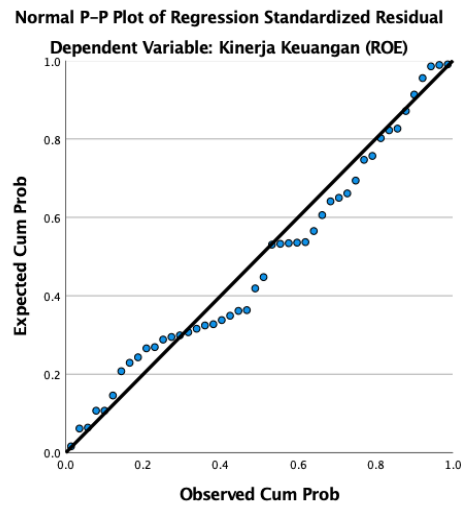
A classical assumption test is a series of tests used to ensure that the data used in multiple linear regression analysis meets the basic assumptions required for the results of the analysis to be interpreted validly and accurately. Violations of these assumptions may result in biased, inaccurate, or non-generalizable results. Here are the types of classical assumption tests in multiple linear regression:

##### 1. Normality Test

The residual normality assumption states that the prediction error (residual) must be normally distributed. Residual normality is very important to ensure the validity of statistical tests such as t-test and F-test, if residual is not normally distributed, then the results of t-test and F-test can be invalid, although the regression coefficient can still be well estimated.

To test normality, you can use the Shapiro-Wilk Test or the Kolmogorov-Smirnov Test which is often used to test whether the residual is normally distributed or you can use a P-P plot (Probability-Probability plot). Here's how to test normality by using the Shapiro-Wilk Test or the Kolmogorov-Smirnov Test and P-P plot using SPSS 27:

Gambar 3. Data Diolah SPSS 27 Probability-Probability Plot (2024)



Normal distribution analysis based on a P-P Plot (Probability-Probability Plot) diagram was performed to check whether the data followed the normal distribution. The P-P Plot compares the cumulative distribution of the sample data with the expected cumulative distribution based on the normal distribution.

If the data points are almost entirely near or parallel to the diagonal line, then the data is considered to follow a normal distribution and if the data points deviate far from the diagonal line (e.g., curved or unevenly spread patterns), then the data does not follow the normal distribution. Based on Figure 2 above, the data points are almost entirely near or parallel to the diagonal line, so the data is considered to follow a normal distribution.

P-P Plot Analysis is a simple but effective visual way to check the normal distribution. Data close to the diagonal line on the P-P Plot indicates a normal distribution, while large deviations indicate an abnormal distribution. Combination with statistical tests will provide stronger results to decide whether or not the data follows a normal distribution.

To perform a normality test in addition to using P-P Plot Analysis, you can also use the Kolmogorov-Smirnov (KS) test, the purpose of which is to test whether the sample data follows a normal distribution. The Kolmogorov-Smirnov test compares the cumulative distribution of sample data with the hypothetical cumulative distribution of normal distribution. The following are the output results of SPSS 27 about the normality test using the One-Sample Kolmogorov-Smirnov Test:

Tabel 6 One-Sample Kolmogorov-Smirnov Test

### One-Sample Kolmogorov-Smirnov Test

|  |                         | Unstandardized Residual |      |
|--|-------------------------|-------------------------|------|
| N  |                         | 46                      |      |
| Normal Parameters <sup>a,b</sup>         | Mean                    | .0000000                |      |
|  | Std. Deviation          | 5.68239334              |      |
| Most Extreme Differences                 | Absolute                | .116                    |      |
|  | Positive                | .116                    |      |
|  | Negative                | -.075                   |      |
| Test Statistic                           |                         | .116                    |      |
| Asymp. Sig. (2-tailed) <sup>c</sup>      |                         | .142                    |      |
| Monte Carlo Sig. (2-tailed) <sup>d</sup> | Sig.                    | .115                    |      |
|  | 99% Confidence Interval | Lower Bound             | .107 |
|  |                         | Upper Bound             | .123 |

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 624387341.

Source : Data Processed SPSS 27 (2024)

Results of the One-Sample Kolmogorov-Smirnov Test, value Asymp. Sig. (2-tailed): This value is the most important to look at. If this value is greater than 0.05, then we fail to reject the null hypothesis that the data comes from a normal distribution. This means that the data can be considered normally distributed. Monte Carlo Sig. (2-tailed): This value also corroborates the result of the Asymp. Sig. value. If both show values greater than 0.05, then the conclusion is stronger.

Based on the results of the Kolmogorov-Smirnov test above, it can be concluded that the data is normally distributed. This means that the data follows a normal distribution pattern (bell-shaped curve).

## 2. Multicollinearity Test

The Multicollinearity test is one of the steps in regression analysis to identify whether there is a high correlation between independent variables in a regression model. If the independent variables have a very strong relationship, then this can cause problems in the interpretation of the regression analysis results because the contribution of each variable becomes difficult to separate. The following are the output results of SPSS 27 on the multicollinearity test:

Table 7 Multicollinearity Test

### Coefficients<sup>a</sup>

| Model |                              | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. | 95.0% Confidence Interval for B |             | Correlations |         |      | Collinearity Statistics |       |
|-------|------------------------------|-----------------------------|------------|---------------------------|-------|------|---------------------------------|-------------|--------------|---------|------|-------------------------|-------|
|       |                              | B                           | Std. Error | Beta                      |       |      | Lower Bound                     | Upper Bound | Zero-order   | Partial | Part | Tolerance               | VIF   |
| 1     | (Constant)                   | 4.026                       | 1.225      |                           | 3.286 | .002 | 1.557                           | 6.495       |              |         |      |                         |       |
|       | Artificial Intelligence (AI) | 5.744                       | 1.696      | .455                      | 3.386 | .002 | 2.326                           | 9.163       | .455         | .455    | .455 | 1.000                   | 1.000 |

a. Dependent Variable: Kinerja Keuangan (ROE)

### Collinearity Diagnostics<sup>a</sup>

| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions |                              |
|-------|-----------|------------|-----------------|----------------------|------------------------------|
|       |           |            |                 | (Constant)           | Artificial Intelligence (AI) |
| 1     | 1         | 1.722      | 1.000           | .14                  | .14                          |
|       | 2         | .278       | 2.490           | .86                  | .86                          |

a. Dependent Variable: Kinerja Keuangan (ROE)

Source : Data Processed SPSS 27 (2024)

Based on the results of the multicollinearity test presented in the table above, it can be interpreted that there is no problem of multicollinearity in the regression model constructed. This can be seen from the VIF (*Variance Inflation Factor*) value and tolerance for the independent variable "Artificial Intelligence (AI)" which are both valued at 1.

#### VIF and Tolerance Values

- VIF: The ideal VIF value is close to 1. A VIF value well above 1 (e.g., above 10) indicates a serious multicollinearity problem. In this case, a VIF value of 1 indicates that no other independent variable contributes significantly to explaining the variance of the "Artificial Intelligence (AI)" variable.
- Tolerance: The tolerance value is the opposite of VIF. A tolerance value close to 1 also indicates the absence of multicollinearity problems.

### 3. Heterokedasticity Test

Heteroscedasticity is an issue that needs to be considered in regression analysis because it can affect the validity of significance tests and estimation efficiency. Performing heteroscedasticity tests and taking steps to address them if necessary, will improve the accuracy of the model and the results of regression analysis. The following are the results of the SPSS 27 output on the heterokedasticity test:

Table 8 Heterokedasticity Test

**Coefficients<sup>a</sup>**

| Model |                              | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|-------|------------------------------|-----------------------------|------------|---------------------------|-------|------|
|       |                              | B                           | Std. Error | Beta                      |       |      |
| 1     | (Constant)                   | .048                        | .017       |                           | 2.881 | .006 |
|       | Artificial Intelligence (AI) | .001                        | .000       | .266                      | 1.832 | .074 |

a. Dependent Variable: ABS\_RES

Source : Data Processed SPSS 27 (2024)

Sig. value for AI (0.074): This significance value is greater than the general significance level used (usually 0.05). This suggests that there is no evidence strong enough to reject the null hypothesis that the coefficient for an AI variable is equal to zero. In other words, there is no significant evidence that the degree of heteroscedasticity is affected by the AI variable.

Overall, the results of the heteroscedasticity test show that the regression model under analysis does not have significant heteroscedasticity problems related to the AI variable.

#### 4. Autocorrelation Test

Autocorrelation can occur in data that has a time sequence, such as time series data, which can affect the validity of regression models. If autocorrelation occurs, then the residual independence assumption in the regression is violated, which can affect the accuracy of the coefficient estimation, as well as make the coefficient significance test invalid. The following are the results of the SPSS 27 output on the autocorrelation test:

Table 8 Autocorrelation Test

**Model Summary<sup>b</sup>**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | Change Statistics |     |     |               | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|-----------------|-------------------|-----|-----|---------------|---------------|
|       |                   |          |                   |                            |                 | F Change          | df1 | df2 | Sig. F Change |               |
| 1     | .455 <sup>a</sup> | .207     | .189              | 5.74660                    | .207            | 11.468            | 1   | 44  | .002          | 2.318         |

a. Predictors: (Constant), Artificial Intelligence (AI)

b. Dependent Variable: Kinerja Keuangan (ROE)

Source : Data Processed SPSS 27 (2024)

The Durbin-Watson test is used to detect the presence of autocorrelations in regression models. The Durbin-Watson value that is commonly used to detect autocorrelation is between 0 and 4.

- Value close to 2: An indication of the absence of autocorrelation.
- Value close to 0: An indication of a positive autocorrelation (residual in one period tends to have the same mark as the previous period).
- Value close to 4: An indication of a negative autocorrelation (residual in one period tends to have the opposite sign of the previous period).

Based on the table provided, the Durbin-Watson value is 2.318. This value is quite close to 2, which indicates that there is no significant evidence of autocorrelation in the regression model being analyzed. It can be concluded that the classic assumption of linear regression, i.e. the absence of autocorrelation, is fulfilled in this model. This means that the residual in one observation does not correlate with the residual in the previous observation. This shows that the regression model built is quite good in explaining the relationship between independent variables (Artificial Intelligence) and dependent variables (Financial Performance).

#### b. Simple Linear Regression Test

A simple linear regression test is a statistical method used to analyze the relationship between a single dependent variable (dependent) and an independent variable (independent). The purpose of this test is to estimate the influence of independent variables on dependent variables and to find out if the relationship is significant. Here are the general steps in performing a simple linear regression test:

##### 1. Determinant Coefficient Test ( $R^2$ )

The Determinant Coefficient ( $R^2$ ) test is used to measure how well the resulting regression model can explain the variability of the observed data. This determination coefficient shows the proportion of variance in the dependent variable that can be explained by the independent variable in the regression model. In linear regression,  $R^2$  ranges from 0 to 1:

- $R^2 = 1$  indicates that the regression model can explain all the variations in the data.
- $R^2 = 0$  indicates that the regression model cannot explain the variation in the data.

The following are the output results of SPSS 27 regarding the determinant coefficient test:

Table 9 Determinant Coefficient Test ( $R^2$ )

### Model Summary<sup>b</sup>

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | Change Statistics |     |     |               |
|-------|-------------------|----------|-------------------|----------------------------|-----------------|-------------------|-----|-----|---------------|
|       |                   |          |                   |                            |                 | F Change          | df1 | df2 | Sig. F Change |
| 1     | .455 <sup>a</sup> | .207     | .189              | 5.74660                    | .207            | 11.468            | 1   | 44  | .002          |

a. Predictors: (Constant), Artificial Intelligence (AI)

b. Dependent Variable: Kinerja Keuangan (ROE)

Source : Data Processed SPSS 27 (2024)

Based on the table, the R-squared value is 0.207. This means that about 20.7% of the variation in financial performance (ROE) can be explained by an independent variable, namely *Artificial Intelligence* (AI). The remainder, about 79.3%, was influenced by other factors not included in the model.

- Contribution of Independent Variables: *Artificial Intelligence* (AI) variables contribute 20.7% in explaining variations in financial performance. This means that the higher the level of use of *Artificial Intelligence*, the higher the possibility of improving financial performance.
- Model Limitations: Although there is a positive relationship between *Artificial Intelligence* and financial performance, the regression model built is only able to explain about 20.7% of the total variation in financial performance. This means that there are many other factors that affect financial performance that have not been explained by this model.

## 2. Uji t (Hypothesis)

The t-test is one of the statistical methods used to test hypotheses related to relationships or differences between variables. In linear regression, the t-test is often used to test the significance of each regression coefficient of an independent variable against a dependent variable. The goal is to determine whether the independent variables individually have a significant influence on the dependent variables. The following are the output results of SPSS 27 about the t test:

Table 10 t-test (hypothesis)

| Model |                              | Unstandardized Coefficients |            | Standardized Coefficients |       | 95.0% Confidence Interval for B |             | Correlations |            |         |      |
|-------|------------------------------|-----------------------------|------------|---------------------------|-------|---------------------------------|-------------|--------------|------------|---------|------|
|       |                              | B                           | Std. Error | Beta                      | t     | Sig.                            | Lower Bound | Upper Bound  | Zero-order | Partial | Part |
| 1     | (Constant)                   | 4.026                       | 1.225      |                           | 3.286 | .002                            | 1.557       | 6.495        |            |         |      |
|       | Artificial Intelligence (AI) | 5.744                       | 1.696      | .455                      | 3.386 | .002                            | 2.326       | 9.163        | .455       | .455    | .455 |

a. Dependent Variable: Kinerja Keuangan (ROE)

Source : Data Processed SPSS 27 (2024)

The regression coefficient significance test aims to test whether the influence of independent variables on dependent variables is statistically significant. In the table you provided, the "Sig." column shows the p-value used to test the null hypothesis that the regression coefficient is equal to zero.

- Sig. value less than 0.05: If the p-value is less than 0.05, then we reject the null hypothesis and conclude that there is a statistically significant relationship between independent variables and dependent variables. This means that the influence of independent variables on dependent variables does not occur by chance.
- Sig. value greater than or equal to 0.05: If the p-value is greater than or equal to 0.05, then we fail to reject the null hypothesis. This means that there is no evidence strong enough to state that there is a statistically significant relationship between independent variables and dependent variables.
- The Sig. value for the variable "*Artificial Intelligence (AI)*" is 0.002. Since this value is much smaller than 0.05, we can conclude that there is a statistically significant relationship between the "*Artificial Intelligence (AI)*" variable and the dependent variable "*Financial Performance (ROE)*". This means that the increase in the use of *Artificial Intelligence* has a significant positive effect on improving financial performance.

Based on the results of the hypothesis test, it can be concluded that the use of *Artificial Intelligence (AI)* has a significant positive effect on financial performance. In other words, companies that adopt AI technology more tend to have better financial performance compared to companies that adopt less of the technology.

### 3. Simple Linear Regression Analysis

Simple linear regression models are generally written as:

$$Y = a + bI \text{ XI} + \varepsilon$$

Where:

- $Y$  : Financial Performance (*Return On Equity*)
- $X1$  : *Artificial Intelligence* (AI)
- $A$  : Constant (intersep)
- $b1$  : Regression coefficient for independent variables
- $\varepsilon$  : Error (residue)

The regression equations obtained based on the results of data processing on SPSS in accordance with Table 10 are as follows:

$$Y = 4.026 + 5.744X1 + \varepsilon$$

Here is a detailed analysis of each component of the regression equation:

#### 1. Constant Interpretation (Intercept) = 4.026

Constant 4.026 indicates the *value of Return on Equity* (ROE) when the independent *variable of Artificial Intelligence* (AI) ( $X1$ ) is valued at zero (0). In other words, if a company doesn't use AI at all, then the estimated ROE of that company is 4,026.

However, in business and financial contexts, constant value does not always have a meaning that is directly relevant in practical terms. This is because in reality, almost no company does not use technology at all or has other supporting factors that can affect ROE. Therefore, this constant serves more as a reference point in regression models.

#### 2. Interpretation of Regression Coefficient ( $b1$ ) = 5.744

A regression coefficient of 5,744 indicates that every 1 unit increase in the use of *Artificial Intelligence* (AI) will increase *the Return on Equity* (ROE) by 5,744 units, assuming that other factors remain constant.

In other words, the higher the rate of adoption of AI in a company's operations, the greater the improvement in financial performance measured through ROE. This increase can occur for several reasons, such as:

- Operational efficiency: AI can automate business processes, reduce operational costs, and increase productivity.
- Data-driven decision-making: With AI, companies can optimize their financial

and investment strategies based on more accurate data analysis.

- Product and service innovation: AI enables the development of more personalized and innovative services, increasing competitiveness and profitability.
- Financial risk mitigation: AI can aid in risk analysis and detection of financial anomalies, thereby reducing potential losses.

Thus, the application of AI in business significantly contributes to increased ROE.

### 3. Interpretation of Error Components ( $\epsilon$ )

The  $\epsilon$  component (error or residue) represents other factors that affect *Return on Equity* (ROE) but is not included in this regression model. Some of the factors that may be included in this error include:

- Macroeconomic conditions, such as inflation, interest rates, and economic growth.
- The company's management strategy, including investment decisions and dividend policy.
- Industry competition, which can affect the profitability of the company.
- Government regulations, such as taxes and monetary policies that can have an impact on a company's finances.

This regression model shows a positive relationship between the application of *Artificial Intelligence* (AI) and the company's financial performance (*Return on Equity* / ROE). Specifically:

- If the company does not use AI at all, it is estimated that the ROE will still be at the level of 4,026.
- Every 1 unit increase in AI usage will increase ROE by 5,744 units.
- However, there are still other factors outside of AI that also affect ROE, which is represented by the error component ( $\epsilon$ ) in this model.

Thus, it can be concluded that investment in AI technology is an important factor in improving a company's financial performance, but it is not the only factor contributing to ROE. Therefore, in strategic decision-making, companies must consider various other aspects that can also affect their profitability.

## 5. Discussion

### *Managerial Implications*

Based on the regression model, the application of AI has a significant and positive effect on the Return on Equity (ROE) of the banking sector. Therefore, bank management must adopt effective AI strategies to increase profitability and competitiveness.

Steps that can be taken:

1. Making AI a part of the main business strategy.
2. Increasing investment in AI technology for operational efficiency.
3. Using AI for risk management and banking security.
4. Improve customer experience through AI services.
5. Adjust HR policies to support digital transformation.
6. Ensure compliance with AI-related regulations in the financial sector.

With the right strategy, AI can be a major catalyst in improving banks' financial performance and providing a competitive advantage in the modern banking industry.

## 6. Conclusions, Implications, and Recommendations

### *6.1. Conclusion*

Based on the results of a simple linear regression analysis on the influence of Artificial Intelligence (AI) on financial performance (Return on Equity / ROE) in the banking sector, several main points can be concluded as follows:

1. Significant and Positive Relationships
  - Regression models show that the use of AI has a significant and positive influence on financial performance. This is shown by a regression coefficient value of 5.744, which means that every 1-unit increase in AI usage will increase ROE by 5.744 units, assuming the other factors remain constant.
  - The results of the t-test show a value of Sig. = 0.002, which is smaller than 0.05. This indicates that the influence of AI on ROE is statistically significant, so the relationships found do not occur by chance.
2. AI's contribution to ROE

- The value of the determination coefficient ( $R^2 = 0.207$ ) showed that 20.7% of the variability of ROE could be explained by the use of AI, while 79.3% was influenced by other factors not included in the model.
- This indicates that AI is one of the factors influencing ROE, but not the only major factor. Other factors such as business strategy, regulations, macroeconomic conditions, and industry competition also play a role in determining the company's financial performance.

### 3. The Role of AI in Increasing ROE

- The application of AI can increase ROE through various mechanisms, such as operational efficiency, data-driven decision-making, product and service innovation, and financial risk mitigation.
- However, it's worth noting that the level of effectiveness of AI depends on how a company implements it in its business and operational strategies.

### 4. Model Limitations

- The model uses only one independent variable, which is AI, which means many other factors that affect ROE have not been included in the analysis.

In addition, there is a possibility of multicollinearity with other technological factors or influencing external factors.

## 6.2. Advice

Based on the results of the analysis, there are several recommendations that can be given to companies, especially in the banking sector, to optimize the use of AI in improving financial performance:

### 1. Integration of AI into Business Strategy

- Company management needs to make AI a part of its core business strategy, with a focus on improving operational efficiency and product innovation.
- The implementation of AI must be aligned with the company's vision and mission to achieve a competitive advantage in the banking industry.

### 2. Increasing Investment in AI Technology

- Companies are advised to increase budget allocation in the development and deployment of AI to improve operational efficiency and effectiveness.
- These investments could include AI systems for data analysis, customer service automation, and financial risk management and regulatory compliance.

### 3. AI Optimization in Risk Management

- AI can be used to detect financial anomalies and analyze credit risk and fraud detection to reduce potential financial losses.
- The application of AI in cybersecurity systems is also an important factor in maintaining customer trust and minimizing operational risks.

### 4. Improving Customer Experience with AI

- Companies can adopt AI technologies in customer service, such as AI-based chatbots, personalization of financial products, and customer behavior analytics to increase customer loyalty.

### 5. Improving Human Resources (HR) Competencies

- Companies need to train employees in the use and utilization of AI so that the implementation of technology can run optimally.
- HR policies that support digital transformation must be implemented, including the retraining of the workforce affected by AI automation.

### 6. Compliance with AI Regulations in the Financial Sector

- AI implementation must follow applicable regulations in the financial sector, including policies related to data security, consumer protection, and transparency in the use of AI technology.
- Companies need to collaborate with regulators to ensure the use of AI does not violate existing rules and still supports financial stability.

## 7. References

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