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Applied Statistical Analysis: Regression Analysis of Islamic Banking Asset Growth and Conventional Banking Growth 2021-2022

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Abstract

This study aims to investigate and analyse the relationship between Islamic banking assets and conventional banking assets in Indonesia. The research methodology involves the use of a linear regression test to determine the dependence relationship between Islamic banking assets (dependent) and conventional banking assets (independent). The results of the analysis showed that there was a significant negative relationship between the variables and the dependent variable, with a significance value of 0.441 (> 0.05). The regression equation obtained Y=0.105-0.158X illustrates that if the independent variable (Islamic banking assets) increases, the dependent variable (conventional banking assets) will decrease, and vice versa. This research is expected to provide practical insights for practitioners to help stakeholders make more informational and informed decisions to make more informational and strategic decisions to achieve their goals.

Keywords; Regression analysis; Islamic banking assets; Conventional banking assets; Relationship
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Introduction

Islamic banking is a financial system that provides financial services in compliance with Islamic Sharia and is based on Sharia law (1). There may be differences between the business models of conventional banks and Islamic banks(2). The vast majority of Muslims desire to use the products and services offered by Islamic banks (1). According to the contemporary theory of financial intermediation, banks are crucial to the functioning of the economy (3). The Islamic banking sector has shown promise in the Muslim nation of Indonesia (4).

Changes in consumer preferences, legal restrictions, social and demographic trends, competition, and technological developments allow customers to use new methods in conjunction with technological advances. Advances in innovation and recent developments in the Islamic banking services industry have changed the commercial landscape (5). This phenomenon gives rise to differences in Islamic banking assets compared with conventional banking assets, which are the focus of the present study (6).

The research's focus is evident from a number of earlier studies, none of which particularly detail both. Research on how the COVID-19 pandemic has mitigated the effect of AI on the effective implementation of cyber governance (CG) in Islamic banks has been conducted (7). New methods for identifying the variables affecting financial stability include two-stage least squares (2SLS) and pooled ordinary least squares (OLS)(8). Knowledge of the mediating role of capital in the relationship between explicit deposit insurance schemes (DIS) and financial stability (9). The connection between Islamic and conventional banking assets is the focus of this study, which assesses the direct relationship between the two variables (10).

This study explored and evaluated the link between Islamic banking assets and conventional banking assets in Indonesia (11). This research is anticipated to offer a comprehensive understanding of the interaction between the Islamic and conventional banking sectors, which in turn can provide valuable information for policy makers and banking practitioners (12).

Results and Discussion

This study focuses on analysing the correlation between Islamic and conventional banking asset growth to understand the dynamics of financial sector development. The linear regression test can provide a regression coefficient that indicates how much change in Islamic banking asset growth can be explained by changes in conventional banking growth (13). The test's results are then analysed to determine whether there is a positive or negative coefficient that represents the effect of variations in the growth of conventional banking on the asset growth of Islamic banking. A positive correlation suggests that the two have a positive relationship; a negative correlation suggests a bad relationship. This statistical research aims to determine whether there is a statistically significant link between the growth of Islamic banking assets and the expansion of conventional banking.

Data Description

The two variables found in the area of quantitative research may be quickly described by utilizing processed data from the Financial Services Authority (OJK). Information on the percentage fluctuations in Islamic banking assets from January 2021 to December 2022(14) During this period, the lowest percentage was recorded in October 2021 at 11.00%, while the highest percentage occurred in August 2022, with a value of 17.25%. The average percentage of Islamic banking assets during this period was approximately 13.22%. In the context of Islamic banking asset data, the standard deviation of the percentage during the period January 2021 to December 2022 provides information on monthly fluctuations in the average percentage(15). According to the standard deviation in the previous data, the average percentage of Islamic banking assets during the period is approximately 13.16%, which suggests that the monthly percentage varies around this average. Moreover, in the context of conventional banking assets (dependent variable), the minimum percentage was recorded in March 2021 at 5%, while the maximum percentage occurred in August 2022, with a value of 10.90%. The average percentage of conventional banking assets during the period was approximately 8.54%. With the minimum and maximum values being quite far from the average, we can conclude that conventional banking assets also significantly fluctuate from month to month (16). Thus, a high level of volatility in the performance of both types of assets indicates a greater level of risk(17).

Regression Test Analysis in Applied Statistical

This study used a linear regression test to determine how the dependent/criterion variable can be predicted through partial or joint/simultaneous variables(18). One parameter that is frequently checked in regression analysis is the regression coefficientdre (19). One statistical method or analysis used to describe the statistical connection between two or more variables is regression analysis (20). Regression analysis is therefore used to investigate the connection of dependence between one or more independent variables (independent variables) and an independent variable (dependent variable) (21). Regression analysis is also used as a tool for forecasting the value of a dependent variable from one independent variable (22).

Usually, a simple linear regression analysis model consists of two variables: one is an independent variable, and the other is an independent variable(23). The independent variable is usually called the criterion variable, and the independent variable is called the predictor variable, which is the variable whose size determines its effect on the independent variable (24). The following data are the result of observations of the value of service quality (X) and the average sales of certain goods (Y) every month. Then, based on the available data, a simple linear regression equation $Y = 1.02 + 5.14X$ is created (25). The main purpose of using a regression equation is to estimate the value of an independent variable at a given value (26).

Once it has been established that there is a logical relationship between the variables, then to support further analysis, a graph can be used. A graph is called a scatter diagram, or some call it a scatter diagram in which certain points are shown. Each point is given a value as a dependent or independent variable (27).

Bivariate Correlation Analysis

Analysis of the coefficient of determination output in the linear regression test between Islamic banking assets as the independent variable and conventional banking assets as the dependent variable provides an overview of the extent to which Islamic banking assets can explain variations in conventional banking assets (28). A coefficient of determination (R-squared) close to 1 indicates that Islamic banking assets effectively explain most of the variation in conventional banking assets, suggesting a strong relationship between the two (29). Conversely, if the R-squared value is low, this may indicate that Islamic banking assets do not significantly contribute to explaining the variation in conventional banking assets or that there may be other factors influencing this relationship (30). This analysis has important implications for stakeholders, as it allows them to evaluate the interrelationship between two types of banking assets and provides a basis for strategic decision-making in the banking industry (31). However, in addition to the coefficient of determination, it is important to consider other metrics and test regression assumptions to ensure the reliability and validity of this linear regression model in this particular context (32).

TABLE 1. Output of Coefficient of Determination from Linear Regression Test between APS and APK Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.165[a]	.027	-.017	.015669

a. Predictors: (Constant), Islamic Bangking Analysis

b. Dependent Variable: Conventional Banking Analysis

Based on the aforementioned data, it can be inferred that the independent variable (APS) has a 2.7% effect on the dependent variable (APK) according to the R squared value of 0.027.

In the context of the linear regression test between Islamic banking assets (APS) as the independent variable and conventional banking assets (APK) as the dependent variable(33), the R-squared result of 0.027 can be interpreted as an indicator of the extent to which Islamic banking assets can explain variations in conventional banking assets(34). The R-squared value of 0.027 suggests that, in this regression model, variations in Islamic banking assets can only account for 2.7% of the variability in conventional banking assets. Stated differently, the impact of Islamic banking assets on conventional banking assets is negligible, and the Islamic banking assets variable in this model is unable to account for the majority of the variance in conventional banking assets (35). This result illustrates that other factors may also affect conventional banking assets, and this regression model may not fully explain the complexity of the relationship between these two types of banking assets(36). Therefore, this interpretation highlights the need for consideration of additional factors and further analysis to understand the factors that may influence conventional banking assets (37).

The t test in regression analysis is used to test the significance of the independent variable on the dependent variable. In the context of Islamic banking asset growth and conventional banking growth(38), the t test can be used to determine whether Islamic banking asset growth is significantly different from conventional banking asset growth(39). A t test produces a high p value that can be used to determine if there is a significant difference between two groups(40). A small p value indicates a significant difference(41).

TABLE 2. T Test Output (Hypothesis Test) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.105	.028		3.713	.001

	Islamic Bangking Analysis	-.158	.202	-.165	-.785	.441

a. Dependent Variable: Conventional Banking Analysis

Before interpreting the output table above, it is first necessary to formulate the hypothesis in this study and determine the basis for decision making through linear regression tests(42).

H0: There is a positive relationship between the APS and APK

H1: There is a negative relationship between APS and APK.

Decision-making based on significance value

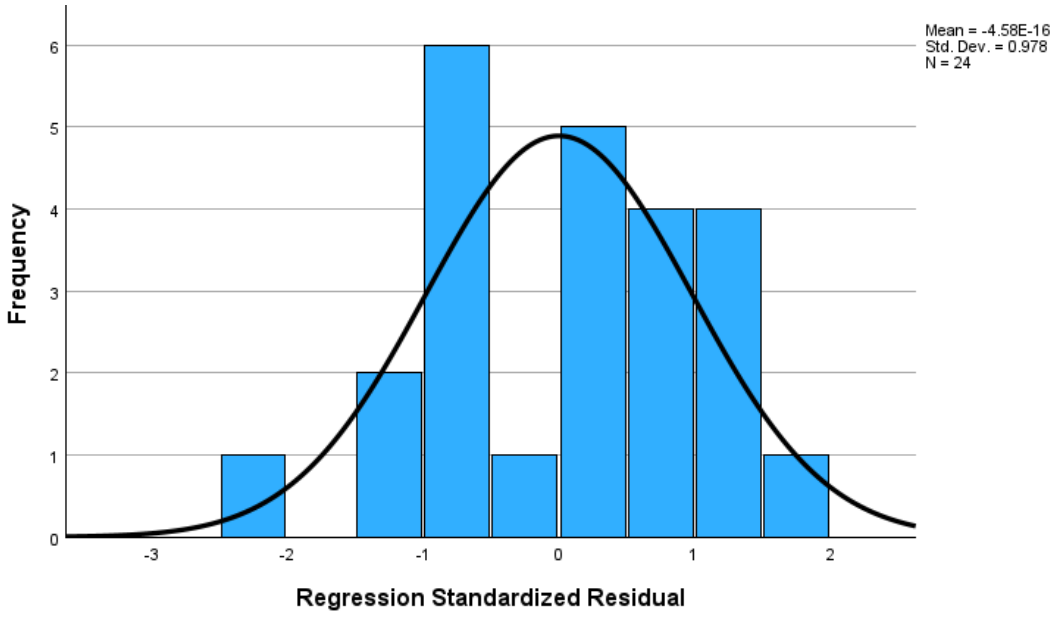
1. A significance value of <0.05 for the independent variable indicates that H0 is accepted and H1 is rejected.
2. A significance value > 0.05 for the independent variable means that H0 is rejected and H1 is accepted.

From the results of the table above, the following conclusions can be drawn:

1. The significance value of the independent variable is 0.441 (> 0.05); thus, H0 is rejected, and H1 is accepted, indicating that the independent variable has a negative relationship with the dependent variable.
2. The regression equation is obtained as follows: 0,105-0,158X
3. A constant value of 0.105 is obtained; if the independent variable is 0 (constant), then the dependent variable is 0.105.
4. The regression coefficient of the independent variable (predictor) is -0.158, and a negative sign indicates that in the regression model, the independent variable has the opposite effect on the dependent variable. In other words, if the independent variable increases, the dependent variable will decrease, or vice versa.

Histograms can be used in regression analyses of the growth of Islamic banking assets relative to the growth of conventional banking assets to better comprehend the data distribution and compare the two variables (43). Histograms can be used to visualize the frequency of occurrence of the growth values of two variables, making it easier to visualize the distribution patterns and differences between them. This approach can help in evaluating the differences in the distribution characteristics of two variables(44).

Figure 1. Histogram of Regression Analysis



If described from the constant coefficient in the form of a histogram above, the constant coefficient value of 0.105 will be the center point of the histogram distribution. This shows the contribution of the constant to the distribution of conventional banking analysis values.

We may characterize the distribution of the coefficient value of -0.158 for the Islamic banking analysis variable from the preceding histogram by choosing an acceptable interval width. The greatest p value for this coefficient, however, is 0.441, suggesting that there is no discernible difference between the asset growth of Islamic banks and that of conventional banks.

Conclusion

A substantial negative link between the independent and dependent variables was discovered by linear regression, with a significance value of 0.441 (> 0.05). The derived regression equation, Y=0.105-0.158X, shows that conventional banking assets, the dependent variable, will decrease if the independent variable, Islamic banking assets, grows, and vice versa. The dependent variable will have a value of 0.105 when the independent variable is 0 (constant), according to the constant value of 0.105. In the context of the regression model that was employed, the overall analysis demonstrated that the independent variables had a considerable impact on the dependent variable and that there was a negative association between the two variables.

The conceptual ramifications of the findings demonstrate that there is a strong negative correlation between the independent variables and the dependent variable.

The knowledge that there is a negative association between the independent and dependent variables offers practitioners or decision makers useful insights, which is one of the practical consequences of the research. To accomplish their objectives, stakeholders are able to make more informed and calculated decisions.

The analysis's findings indicate that the independent and dependent variables have a negative connection, leading to this conclusion. There exists a correlation between a rise in the independent variable and a fall in the dependent variable, and vice versa. Understanding the link, being able to anticipate using regression equations, the impact of independent variables when they are zero, risk management, and decision optimization are among the practical consequences of the findings. Practitioners and decision makers can use this information in a variety of scenarios to help them make more strategic and well-informed choices.

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