



Determinant Factors of Profitability in Fintech Lending Companies in Indonesia from 2019 to 2022 Using Principal Component Analysis (PCA)

Aditya Novanto Nomba¹, Brady Rikumahu^{2*}
Universitas Telkom

Corresponding Author: Brady Rikumahu: bradyrikumahu@telkomuniversity.ac.id

ARTICLE INFO

Keywords: PCA,
Profitability, Liquidity,
Solvency, Activity

Received : 12, August
Revised : 20, September
Accepted: 25, Oktober

©2024 Nomba, Rikumahu (s):
This is an open-access article
distributed under the terms of the
[Creative Commons Atribusi 4.0
Internasional](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

This reserach examines factors influencing the profitability of Fintech lending companies in Indonesia. A purposive sampling method was employed to select 45 companies annually. The data for this research are cross-sectional, comprising the years 2019, 2020, 2021, and 2022. The methods in this research are Principal Component Analysis (PCA) and multiple linear regression. Findings reveal that current ratio, cash ratio, working capital turnover, debt to assets ratio, short-term debt ratio, equity multiplier, total assets turnover, fixed assets turnover, tangible assets ratio, and effective tax rate significant determinants of profitability for Fintech lending companies in Indonesia. This reserach can help Fintech lending companies improve their profitability.

INTRODUCTION

Financial Technology (Fintech) has experienced a period of rapid growth and transformation, with the advent of a range of digital services that have significantly impacted business processes. Fintech is a technology that can facilitate the transaction process between sellers and buyers, reduce the possibility of fraud, and accommodate legal and secure payments without the need for paper instruments (Wardhana et al., 2023). The Indonesian fintech industry has expanded rapidly over the past decade. As stated by Kumar et al. (2023), among the various types of fintech, such as lending, payment, and wealth, the category of fintech lending has experienced the most substantial growth in terms of the number of companies. Specifically, there has been a significant increase in the number of companies engaged in fintech lending, from 7 in 2011 to 117 companies in 2022. Fintech lending, also known as peer-to-peer lending, is a digital platform that facilitates interactions between individuals or groups seeking loans and individuals or institutions offering funding for loans (Wardhana et al., 2023).

The rapid growth of fintech lending in Indonesia, which involves numerous parties, necessitates the monitoring of the profitability of fintech lending companies in Indonesia. This is crucial to ensure that the interests of all parties involved are fully accommodated. However, based on the results of observations made by researchers on 45 fintech lending companies that are consistently registered with OJK in 2019-2022, it can be seen that the majority of these companies have not been able to achieve maximum profitability, as reflected in the negative ROA values recorded each year. In this case, the average ROA value in 2019 was -94.53%, in 2020 it was -47.11%, in 2021 it was -40.44%, and in 2022 it was -51.65%. It is therefore important to identify the factors that affect the profitability of fintech lending companies in Indonesia. This will enable these companies to consider the necessary improvements to increase their profitability.

This research will have a beneficial impact on future studies examining the subject of company profitability. Furthermore, this research can constitute a reference point for the assessment of Fintech Lending companies in Indonesia in order to enhance their profitability. On the other hand, for stakeholders of Fintech Lending companies in Indonesia, this research can provide an overview of the condition of Fintech Lending companies in Indonesia and can be one of the considerations before making business decisions in the future. The objective of this study is to analyze the determinants of profitability of Fintech Lending companies in Indonesia.

THEORETICAL REVIEW

Company Profitability

Profitability is a primary indicator of a company's future potential, especially in terms of its capacity to generate profits, based on past performance. One of the key indicators used to assess the profitability ratio is the return on assets (ROA). As defined by Agustin et al. (2023), Return on Assets (ROA) is a financial indicator that reflects a company's ability to generate profits based on the total assets owned by the company. A higher ROA value indicates greater efficiency in generating profits from assets. The use of ROA for measuring company profitability has been employed by (Akhund & Qazi, 2023; Anton & Nucu, 2021) in their respective research studies.

Liquidity Ratio

Financial indicators that show a company's capacity to fulfill its next due obligations can be classified as liquidity ratios (Sitorus et al., 2024). The liquidity ratios included in this research are the current ratio, cash ratio, cash holding level, net working capital ratio, working capital turnover, and receivables turnover.

Solvency Ratio

According to Sukamulja (2019), financial measures that reflect the financial risk of the company in terms of its ability to meet its debts is the definition of solvency ratio. The solvency ratios used in this study are debt to equity ratio, debt to assets ratio, long term debt ratio, short term debt ratio, equity ratio and equity multiplier.

Activity Ratio

As posited by Ikhwan & Suhendi (2024), the activity ratio is a financial indicator that gauges the efficacy with which a company manages and deploys its resources or assets. The activity ratios employed in this study are total assets turnover, fixed assets turnover, and tangible assets ratio.

Company Characteristics

Company characteristics are specific factors that distinguish one company from another (Nafis & Sebrina, 2023). In this research, the company characteristics measured are firm size and firm age.

Tax Management

The benchmark utilized to assess a company's efficacy in managing its tax obligations is the definition of tax management (Zahra et al., 2024). In this research, the tax management measure employed is the effective tax rate.

Research Hypothesis

In light of the aforementioned theoretical frameworks, the researchers propose the following research hypothesis for the study.

- H1: The principal component of year i ($i = \text{years } 2019 - 2022$) generated through the PCA method simultaneously has a significant effect on company profitability.
- H2: The principal component of year i ($i = \text{years } 2019 - 2022$) generated through the PCA method partially has a significant effect on company profitability.

The following is a framework for this research:

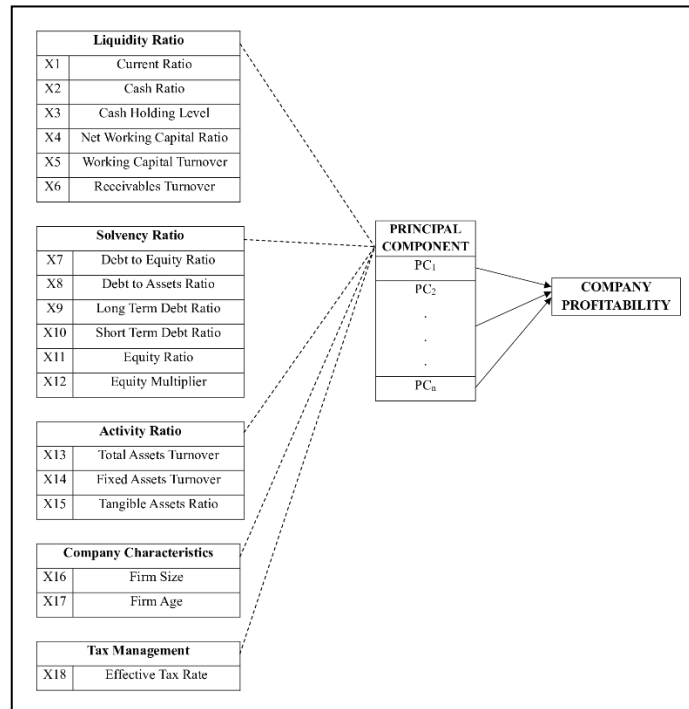


Figure 1. Conceptual Framework

METHODOLOGY

The population of this research is a Fintech lending company registered with the Otoritas Jasa Keuangan (OJK) between 2019 and 2022. In this study, researchers employed one type of non-probability sampling technique, namely the purposive sampling method, to determine the sample to be used. The following is a table of sample selection criteria used in this reserach.

Table 1. Research Sample Criteria

No	Criteria	Total
1	P2P Lending companies registered with OJK in 2019	164
2	P2P Lending companies that are not consistently registered with OJK during the period 2019-2022	(63)
3	P2P Lending companies that do not consistently publish financial reports during the period 2019-2022	(56)
Number of Research Sample Companies Each Year from 2019 to 2022		45

This research will analyze 18 independent variables and 1 dependent variable. The following variable operationalization table provides the formula for each variable.

Table 2. Variable Operationalization

Variable		Indicator
Dependent Variable		
Company Profitability (Y)		$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$ (Sutrisno & Riduwan, 2022)
Independent Variables		
Liquidity Ratio	Current Ratio (X1)	$CR = \frac{\text{Current Assets}}{\text{Current Liabilities}}$ (Fitriyana et al., 2020)
	Cash Ratio (X2)	$\text{Cash Ratio} = \frac{\text{Cash and Cash Equivalents}}{\text{Current Liabilities}}$ (Chintha & Prasad, 2021)
	Cash Holding Level (X3)	$CHL = \frac{\text{Cash and Cash Equivalents}}{\text{Total Assets}}$ (Doan, 2020)
	Net Working Capital Ratio (X4)	$NWC = \frac{\text{Current Assets} - \text{Current Liabilities}}{\text{Total Assets}}$ (Liu et al., 2024)
	Working Capital Turnover (X5)	$WCT = \frac{\text{Revenue}}{\text{Current Assets} - \text{Current Liabilities}}$ (Hidayat & Dewi, 2023)
	Receivables Turnover (X6)	$\text{Receivable Turnover} = \frac{\text{Revenue}}{\text{Accounts Receivable}}$ (Sukamulja, 2019)
Solvency Ratio	Debt to Equity Ratio (X7)	$DER = \frac{\text{Total Liabilities}}{\text{Total Equity}}$ (Paringga & Kurniawati, 2022)
	Debt to Assets Ratio (X8)	$DAR = \frac{\text{Total Liabilities}}{\text{Total Assets}}$ (Hilmi & Aini, 2022)
	Long Term Debt Ratio (X9)	$LTD = \frac{\text{Non - Current Liabilities}}{\text{Total Assets}}$ (Ngatno et al., 2021)
	Short Term Debt Ratio (X10)	$STD = \frac{\text{Current Liabilities}}{\text{Total Assets}}$ (Foong et al., 2021)
	Equity Ratio (X11)	$EAR = \frac{\text{Total Equity}}{\text{Total Assets}}$

		(Gazi et al., 2021)
	Equity Multiplier (X12)	$EM = \frac{\text{Total Assets}}{\text{Total Equity}}$ (Tekin, 2021)
Activity Ratio	Total Assets Turnover (X13)	$TATO = \frac{\text{Revenue}}{\text{Total Assets}}$ (Karim et al., 2023)
	Fixed Assets Turnover (X14)	$FATO = \frac{\text{Revenue}}{\text{Fixed Assets}}$ (Purba & Bimantara, 2020)
	Tangible Assets Turnover (X15)	$\text{Tang} = \frac{\text{Fixed Assets}}{\text{Total Assets}}$ (Msomi & Nzama, 2023)
Company Characteristics	Firm Size (X16)	$\text{Size} = \ln(\text{Total Assets})$ (Phuong & Anh, 2022)
	Firm Age (X17)	$\text{Age} = \text{Research Year} - \text{Establishment Year}$ (Prasetiya & Suwarno, 2024)
Tax Management	Effective Tax Rate (X18)	$ETR = \frac{\text{Tax Expense}}{\text{Earnings Before Taxes}}$ (Azam & Wang, 2020)

The statistical method applied in this research is descriptive statistics, utilizing secondary data. Subsequently, this research employs a cross-sectional data type. Accordingly, the data will be examined for each of the years 2019, 2020, 2021, and 2022. The data will be analyzed using principal component analysis (PCA) and multiple linear regression. Principal Component Analysis (PCA) is a method for extracting essential information from a complex data set (Widodo & Yusiana, 2021). The objective of employing the PCA technique is to reduce the initial data set into a more simplistic structure, known as the Principal Component (PC), which can then be comprehensively examined. The Principal Component (PC) thus obtained will then be assessed using multiple linear regression to determine its impact on company profitability. The data processing in this study was conducted using the SPSS software.

RESULTS

Prior to initiating the PCA and multiple linear regression processes, the researchers conducted preliminary classical assumption, KMO, and Bartlett's tests to ascertain the viability of the data for utilization. The results of the normality test indicated that some data were automatically excluded by SPSS due to the presence of a divisor equal to zero, which resulted in an "#DIV/0!" designation. Additionally, the heteroscedasticity and multicollinearity tests revealed the exclusion of certain variables by SPSS due to the presence of a markedly high correlation between variables. Conversely, the KMO and Bartlett tests revealed that the matrix derived from the research data was non-positive definite. As defined by Kracht & Waller (2020), a Non-Positive Definite Matrix (NPD) is one that possesses one or more negative eigenvalues. Consequently, when an NPD matrix is employed, PCA testing is rendered infeasible.

Therefore, the researchers elected to exclude several variables and one research sample (Roni & Djajadikerta, 2021). The variables excluded from the analysis process are the net working capital ratio, receivables turnover, debt to equity ratio, long-term debt ratio, equity ratio, and firm size. Moreover, the researchers excluded one research sample, which resulted in several missing values in the data set. On the other hand, the researchers also performed a natural logarithm transformation on several research variables (Budi et al., 2024). In 2019, the researchers conducted data transformation for the variables current ratio, debt to assets ratio, and tangible assets ratio. In 2020, the researchers implemented a data transformation for the variables current ratio, cash ratio, and debt to assets ratio. In 2021, the researchers did not perform any data transformations. In 2022, the researchers transformed the data for the variables short-term debt ratio and debt to assets ratio. After the exclusion of one sample, the exclusion of six variables, and the transformation of the data, the data analysis process may commence. The data to be analyzed are 1 dependent variable and 12 independent variables, with 44 companies used as research samples for each of the years 2019, 2020, 2021, and 2022.

Once the data to be utilized has been validated as suitable for analysis, the researcher initiates a principal component analysis (PCA) test. This PCA test is designed to reduce the dimensionality of the data, thereby identifying the principal components that exert the most significant influence on company profitability. As the data in this study is examined in a cross-sectional framework, the researchers conducted a PCA test for each year from 2019 to 2022. The following represents the phases of the PCA test that was conducted.

1. Standardization of Variable X into Standard Variable Z

It is essential to standardize the independent variable (X) into a standard variable (Z) in order to ensure that the scale of the data to be tested is equalized and that the results of the PCA method are accurate. This is necessary because varying data scales have the potential to produce biased results in the analysis conducted. As Kurniawati & Rikumahu (2018) state, standardization can reduce bias in the analysis conducted because data that has been standardized will have the same characteristics, that is an average value of zero and a standard deviation of one.

2. Determining Principal Component

After the data has been standardized, the researchers determine the principal components using the PCA method. The process of determining the principal components is comprised of several stages, including the conducting of the Kaiser Meyer Olkin (KMO) and Bartlett's tests, the Measurement Sampling Adequacy (MSA) test, the testing of the correlation matrix, and the final determination of the principal components.

a. Kaiser Meyer Olkin (KMO) dan Bartlett's Test

KMO testing is employed to assess the overall adequacy of research data. The overall research data is considered sufficient when the KMO value > 0.5 . Next, Bartlett's test is conducted to assess the correlation

between research variables. Research variables are considered highly correlated and suitable for analysis using the PCA method if the Bartlett's Test of Sphericity value is < 0.05 . The following are the results of the KMO and Bartlett's tests in this research.

Table 3. KMO dan Bartlett's Test Results

Year	KMO	Bartlett's
2019	0.520	0.000
2020	0.594	0.000
2021	0.515	0.000
2022	0.544	0.000

b. Measure Sampling Adequacy (MSA) Test

MSA testing is conducted to provide an overview of the adequacy of the research data, which is partially discernible through the amount of partial correlation between the variables utilized. The results of the MSA test will be observed in the anti-image correlation matrix. If the MSA value in the matrix is between 0.5 and 1, then the related variables exhibit a strong correlation with other research variables. However, if the MSA value is less than 0.5, then the related variables demonstrate a weak correlation with other variables. The following are the results of the KMO and Bartlett's tests in this study.

Table 4. MSA Test Results

Variable	MSA 2019	MSA 2020	MSA 2021	MSA 2022
CR	0.626	0.607	0.560	0.612
Cash	0.610	0.534	0.541	0.605
CHL	0.234	0.357	0.181	0.515
WCT	0.435	0.243	0.734	0.469
DAR	0.772	0.752	0.517	0.606
STD	0.550	0.798	0.552	0.682
EM	0.392	0.554	0.632	0.507
TATO	0.451	0.617	0.491	0.437
FATO	0.493	0.624	0.457	0.490
Tang	0.356	0.559	0.292	0.185
Age	0.286	0.691	0.377	0.353
ETR	0.305	0.712	0.729	0.122

c. Correlation Matrix Testing

The goal of correlation matrix testing is to identify factors by reducing the amount of data included in the research. Based on the correlation matrix test, the eigenvalues will be generated, which will serve as a basis for determining the number of principal components selected. The principal component chosen is the one that explains the largest variance. The greater the eigenvalues, the greater the variance explained. The principal components selected are those with eigenvalues > 1 . The following is a summary of the results of testing the correlation matrix for principal components that have eigenvalues > 1 in each year.

Table 5. Correlation Matrix Testing Results for 2019

Principal Component	Eigenvalues	%Variance	Cumulative %Variance
1	3.499	29.162	29.162
2	1.674	13.954	43.116
3	1.349	11.241	54.357
4	1.281	10.673	65.029

Table 6. Correlation Matrix Testing Results for 2020

Principal Component	Eigenvalues	%Variance	Cumulative %Variance
1	3.372	28.104	28.104
2	2.138	17.818	45.922
3	1.455	12.124	58.046
4	1.174	9.784	67.830

Table 7. Correlation Matrix Testing Results for 2021

Principal Component	Eigenvalues	%Variance	Cumulative %Variance
1	3.432	28.602	28.602
2	1.960	16.333	44.935
3	1.839	15.327	60.262
4	1.218	10.152	70.414
5	1.081	9.008	79.423

Table 8. Correlation Matrix Testing Results for 2022

Principal Component	Eigenvalues	%Variance	Cumulative %Variance
1	3.679	30.656	30.656
2	1.907	15.895	46.551
3	1.395	11.621	58.172
4	1.296	10.797	68.968
5	1.022	8.518	77.486

d. Principal Component Determination

Once the number of principal components that explain the largest variance has been determined, the next step is to assign weights based on the loading values. Subsequently, the loading value of the weighting results must be rotated using the varimax rotation method. Varimax rotation is employed to facilitate the interpretation of the effect of standard variables on the principal component. Standard variables are selected as the primary factor in a principal component when they have a loading value of ≥ 0.5 . The following is the loading value that has been rotated using the varimax rotation method.

Table 9. Factor Loading in 2019 After Varimax Rotation

Variable	PC ₁	PC ₂	PC ₃	PC ₄
CR	-0.934	-0.196	0.060	-0.041
Cash	-0.691	0.080	0.025	0.144
CHL	-0.153	-0.101	0.230	0.687
WCT	0.149	0.774	-0.225	-0.181

DAR	0.902	0.148	0.001	0.059
STD	0.691	0.262	0.175	0.115
EM	0.219	0.012	0.697	0.272
TATO	0.157	0.929	0.012	0.045
FATO	0.216	0.670	0.442	-0.082
Tang	0.177	0.104	-0.684	0.255
Age	-0.152	-0.011	0.169	-0.689
ETR	-0.046	0.479	-0.107	0.389

Table 10. Factor Loading in 2020 After Varimax Rotation

Variable	PC ₁	PC ₂	PC ₃	PC ₄
CR	-0.821	-0.085	0.431	0.087
Cash	-0.602	-0.066	0.732	-0.001
CHL	0.003	-0.032	0.936	0.006
WCT	0.011	0.123	0.078	0.924
DAR	0.808	0.373	-0.119	-0.097
STD	0.770	-0.135	-0.020	0.032
EM	0.301	0.289	0.170	-0.416
TATO	-0.034	0.696	-0.034	-0.421
FATO	0.001	0.821	0.061	0.101
Tang	0.566	-0.398	0.034	-0.104
Age	-0.467	-0.190	-0.336	0.009
ETR	0.096	0.764	-0.064	0.043

Table 11. Factor Loading in 2021 After Varimax Rotation

Variable	PC ₁	PC ₂	PC ₃	PC ₄	PC ₅
CR	-0.126	-0.063	0.941	-0.121	-0.056
Cash	-0.060	-0.053	0.955	-0.070	0.101
CHL	0.055	0.062	0.330	-0.001	0.733
WCT	0.195	0.810	0.004	0.238	0.007
DAR	0.889	0.250	-0.207	0.068	-0.011
STD	0.885	0.259	-0.137	0.093	0.002
EM	0.110	0.905	-0.052	-0.009	0.079
TATO	0.082	0.153	-0.113	0.937	-0.001
FATO	-0.017	0.134	-0.054	0.923	0.051
Tang	0.652	-0.321	0.158	-0.142	0.226
Age	-0.059	-0.054	0.212	-0.068	-0.804
ETR	-0.061	0.558	-0.107	0.439	0.079

Table 12. Factor Loading in 2022 After Varimax Rotation

Variable	PC ₁	PC ₂	PC ₃	PC ₄	PC ₅
CR	-0.933	-0.011	0.036	0.079	0.097
Cash	-0.941	-0.016	0.034	0.071	0.114
CHL	-0.207	0.065	0.096	-0.494	0.577
WCT	0.011	-0.021	-0.829	0.185	-0.128
DAR	0.906	0.086	0.125	0.211	0.175
STD	0.853	0.226	0.140	0.121	0.127
EM	0.119	0.003	0.869	0.092	-0.006
TATO	0.214	0.815	-0.109	0.042	0.198
FATO	0.176	0.748	0.131	-0.467	0.150
Tang	0.078	-0.027	-0.057	0.832	0.151

Age	-0.089	-0.135	-0.086	-0.204	-0.818
ETR	0.192	-0.504	-0.118	-0.371	0.295

3. Determining the Principal Component Equation

Once the principal components have been selected based on the eigenvalues and the influence of the standard variables that comprise each principal component is known through the loading value, the next step is to compile the selected principal component equation for each year 2019, 2020, 2021, and 2022. The principal component equation is constructed based on the loading values presented in Table 9 for 2019, Table 10 for 2020, Table 11 for 2021, and Table 12 for 2022.

a. Principal Component Equation for 2019

$$PC_1 = -0,934(Z_1) - 0,691(Z_2) - 0,153(Z_3) + 0,149(Z_4) + 0,902(Z_5) + 0,691(Z_6) + 0,219(Z_7) + 0,157(Z_8) + 0,216(Z_9) + 0,177(Z_{10}) - 0,152(Z_{11}) - 0,046(Z_{12}) + e$$

$$PC_2 = -0,196(Z_1) + 0,080(Z_2) - 0,101(Z_3) + 0,774(Z_4) + 0,148(Z_5) + 0,262(Z_6) + 0,012(Z_7) + 0,929(Z_8) + 0,670(Z_9) + 0,104(Z_{10}) - 0,011(Z_{11}) + 0,479(Z_{12}) + e$$

$$PC_3 = 0,060(Z_1) + 0,025(Z_2) + 0,230(Z_3) - 0,225(Z_4) + 0,001(Z_5) + 0,175(Z_6) + 0,697(Z_7) + 0,012(Z_8) + 0,442(Z_9) - 0,684(Z_{10}) + 0,169(Z_{11}) - 0,107(Z_{12}) + e$$

$$PC_4 = -0,041(Z_1) + 0,144(Z_2) + 0,687(Z_3) - 0,181(Z_4) + 0,059(Z_5) + 0,115(Z_6) + 0,272(Z_7) + 0,045(Z_8) - 0,082(Z_9) + 0,255(Z_{10}) - 0,689(Z_{11}) + 0,389(Z_{12}) + e$$

b. Principal Component Equation for 2020

$$PC_1 = -0,821(Z_1) - 0,602(Z_2) + 0,003(Z_3) + 0,011(Z_4) + 0,808(Z_5) + 0,770(Z_6) + 0,301(Z_7) - 0,034(Z_8) + 0,001(Z_9) + 0,566(Z_{10}) - 0,467(Z_{11}) - 0,096(Z_{12}) + e$$

$$PC_2 = -0,085(Z_1) - 0,066(Z_2) - 0,032(Z_3) + 0,123(Z_4) + 0,373(Z_5) - 0,135(Z_6) + 0,289(Z_7) + 0,696(Z_8) + 0,821(Z_9) - 0,398(Z_{10}) - 0,190(Z_{11}) + 0,764(Z_{12}) + e$$

$$PC_3 = 0,431(Z_1) + 0,732(Z_2) + 0,936(Z_3) + 0,078(Z_4) - 0,119(Z_5) - 0,020(Z_6) + 0,170(Z_7) - 0,034(Z_8) + 0,061(Z_9) + 0,034(Z_{10}) - 0,336(Z_{11}) - 0,064(Z_{12}) + e$$

$$PC_4 = 0,087(Z_1) - 0,001(Z_2) + 0,006(Z_3) + 0,924(Z_4) - 0,097(Z_5) + 0,032(Z_6) - 0,416(Z_7) - 0,421(Z_8) + 0,101(Z_9) - 0,104(Z_{10}) + 0,009(Z_{11}) + 0,043(Z_{12}) + e$$

c. Principal Component Equation for 2021

$$PC_1 = -0,126(Z_1) - 0,060(Z_2) + 0,055(Z_3) + 0,195(Z_4) + 0,889(Z_5) + 0,885(Z_6) + 0,110(Z_7) + 0,082(Z_8) - 0,017(Z_9) + 0,652(Z_{10}) - 0,059(Z_{11}) - 0,061(Z_{12}) + e$$

$$PC_2 = -0,063(Z_1) - 0,053(Z_2) + 0,062(Z_3) + 0,810(Z_4) + 0,250(Z_5) + 0,259(Z_6) + 0,905(Z_7) + 0,153(Z_8) + 0,134(Z_9) - 0,321(Z_{10}) - 0,054(Z_{11}) + 0,558(Z_{12}) + e$$

$$PC_3 = 0,941(Z_1) + 0,955(Z_2) + 0,330(Z_3) + 0,004(Z_4) - 0,207(Z_5) - 0,137(Z_6) - 0,052(Z_7) - 0,113(Z_8) - 0,054(Z_9) + 0,158(Z_{10}) + 0,212(Z_{11}) - 0,107(Z_{12}) + e$$

$$PC_4 = -0,121(Z_1) - 0,070(Z_2) - 0,001(Z_3) + 0,238(Z_4) + 0,068(Z_5) + 0,093(Z_6) - 0,009(Z_7) + 0,937(Z_8) + 0,923(Z_9) - 0,142(Z_{10}) - 0,068(Z_{11}) + 0,439(Z_{12}) + e$$

$$PC_5 = -0,056(Z_1) + 0,101(Z_2) + 0,733(Z_3) + 0,007(Z_4) - 0,011(Z_5) + 0,002(Z_6) + 0,079(Z_7) - 0,001(Z_8) + 0,051(Z_9) + 0,226(Z_{10}) - 0,804(Z_{11}) + 0,079(Z_{12}) + e$$

d. Principal Component Equation for 2022

$$PC_1 = -0,933(Z_1) - 0,941(Z_2) - 0,207(Z_3) + 0,011(Z_4) + 0,906(Z_5) + 0,853(Z_6) + 0,119(Z_7) + 0,214(Z_8) + 0,176(Z_9) + 0,078(Z_{10}) - 0,089(Z_{11}) - 0,192(Z_{12}) + e$$

$$PC_2 = -0,011(Z_1) - 0,016(Z_2) + 0,065(Z_3) - 0,021(Z_4) + 0,086(Z_5) + 0,226(Z_6) + 0,003(Z_7) + 0,815(Z_8) + 0,748(Z_9) - 0,027(Z_{10}) - 0,135(Z_{11}) - 0,504(Z_{12}) + e$$

$$PC_3 = 0,036(Z_1) + 0,034(Z_2) + 0,096(Z_3) - 0,829(Z_4) + 0,125(Z_5) + 0,140(Z_6) + 0,869(Z_7) - 0,109(Z_8) + 0,131(Z_9) - 0,057(Z_{10}) - 0,086(Z_{11}) - 0,118(Z_{12}) + e$$

$$PC_4 = 0,079(Z_1) + 0,071(Z_2) - 0,494(Z_3) + 0,185(Z_4) + 0,211(Z_5) + 0,121(Z_6) + 0,092(Z_7) + 0,042(Z_8) - 0,467(Z_9) + 0,832(Z_{10}) - 0,204(Z_{11}) - 0,371(Z_{12}) + e$$

$$PC_5 = 0,097(Z_1) + 0,114(Z_2) + 0,577(Z_3) - 0,128(Z_4) + 0,175(Z_5) + 0,127(Z_6) - 0,006(Z_7) + 0,198(Z_8) + 0,150(Z_9) + 0,151(Z_{10}) - 0,818(Z_{11}) + 0,295(Z_{12}) + e$$

4. Determining the Principal Component Regression Equation

The next step is to perform multiple linear regression of the selected principal components on the dependent variable of company profitability. This was conducted for each year from 2019 to 2022. The purpose of this stage is to determine the relationship of each principal component to the company's profitability. The principal component regression equation will be explained in accordance with the results of the multiple linear regression of the selected principal components. The following is the principal component regression equation in this study.

a. Principal Component Regression Equation for 2019

$$\text{Profitability for 2019} = -0,864 - 0,356(PC_1) + 0,442(PC_2) + 0,445(PC_3) - 0,118(PC_4) + e$$

b. Principal Component Regression Equation for 2020

$$\text{Profitability for 2020} = -0,482 - 0,334(PC_1) + 0,342(PC_2) - 0,065(PC_3) - 0,021(PC_4) + e$$

c. Principal Component Regression Equation for 2021

$$\text{Profitability for 2021} = -0,418 - 0,115(PC_1) + 0,121(PC_2) + 0,053(PC_3) + 0,274(PC_4) - 0,025(PC_5) + e$$

d. Principal Component Regression Equation for 2022

$$\text{Profitability for 2022} = -0,529 - 0,183(PC_1) + 0,232(PC_2) - 0,237(PC_3) - 0,328(PC_4) + 0,088(PC_5) + e$$

5. Inverse Transformation

The final stage of the PCA method is the implementation of an inverse transformation. At this stage, the data that has been presented in the form of principal component values will be returned to its original form, prior to the data being analyzed using the PCA method.

The objective of this stage is to interpret the effect of the independent variables, which are no longer the standard variables that comprise the principal component, on the dependent variable. The following is the principal component regression equation after conversion to its original form.

a. Inverse Transformation Result for 2019

$$\begin{aligned} \text{Profitability for 2019} = & 1,0805 + 0,1250 (X_1) + 0,0012 (X_2) + 0,6184 (X_3) + \\ & 0,0128 (X_4) - 0,1137 (X_5) - 0,1033 (X_6) + 0,0051 (X_7) + \\ & 0,2102 (X_8) + 0,0090 (X_9) - 0,1940 (X_{10}) + 0,0152 (X_{11}) + \\ & 0,1609 (X_{12}) + e \end{aligned}$$

b. Inverse Transformation Result for 2020

$$\begin{aligned} \text{Profitability for 2020} = & -0,0800 + 0,1047 (X_1) + 0,0574 (X_2) - 0,2427 (X_3) + \\ & 0,0008 (X_4) - 0,0867 (X_5) - 0,4487 (X_6) - 0,0005 (X_7) + \\ & 0,2192 (X_8) + 0,0063 (X_9) - 1,7445 (X_{10}) + 0,0396 (X_{11}) + \\ & 0,9529 (X_{12}) + e \end{aligned}$$

c. Inverse Transformation Result for 2021

$$\begin{aligned} \text{Profitability for 2021} = & -0,0155 + 0,0003 (X_1) + 0,0004 (X_2) + 0,0002 (X_3) + \\ & 0,0082 (X_4) - 0,1891 (X_5) - 0,1588 (X_6) + 0,0367 (X_7) + \\ & 0,1459 (X_8) + 0,0041 (X_9) - 1,7729 (X_{10}) + 0,0046 (X_{11}) + \\ & 1,0790 (X_{12}) + e \end{aligned}$$

d. Inverse Transformation Result for 2022

$$\begin{aligned} \text{Profitability for 2022} = & 0,4136 + 0,0003 (X_1) + 0,0004 (X_2) + 0,7530 (X_3) + \\ & 0,0029 (X_4) - 0,1364 (X_5) - 0,0934 (X_6) - 0,0114 (X_7) + \\ & 0,0801 (X_8) + 0,0046 (X_9) - 2,7551 (X_{10}) + 0,0001 (X_{11}) + \\ & 0,0275 (X_{12}) + e \end{aligned}$$

Following the completion of the PCA test, the researchers proceeded to utilise the test results to evaluate the previously established hypothesis. The hypothesis testing conducted in this study encompasses three distinct approaches: the coefficient of determination (R^2) test, the simultaneous test (F test), and the partial test (t test). Given that the data in this study is analysed in a cross-sectional framework, the researchers conducted each hypothesis testing approach for each year from 2019 to 2022.

1. Coefficient of Determination Test (R^2)

The coefficient of determination (R^2) test is employed to ascertain the proportion of variance in the dependent variable that can be attributed by the independent variable within a research model. In this study, the coefficient of determination test evaluates the explanatory power of the principal components selected for each of the years 2019, 2020, 2021, and 2022 in relation to the company's profitability. The results of the coefficient of determination test in this study are presented below.

Table 13. Coefficient of Determination Test Results

Year	Adjusted R-Square
2019	0.096
2020	0.231
2021	0.089
2022	0.094

2. Simultaneous Test (F-test)

The objective of simultaneous hypothesis testing (F-test) is to ascertain whether the independent variables employed in this study collectively exert an influence on the dependent variable. In this study, the F-test is utilized to determine whether the principal components selected in 2019, 2020, 2021, and 2022 simultaneously influence the company's profitability. The following are the findings of the simultaneous test in this study.

Table 14. Simultaneous Test Results

Year	Significance of F-test
2019	0.094***
2020	0.006*
2021	0.129
2022	0.119

*Significant at 1%, **Significant at 5%, ***Significant at 10%

3. Partial Test (t-test)

Partial hypothesis testing (t-test) was employed to establish whether each independent variable in the study exerts an influence on the dependent variable. In this study, the t-test was utilized to ascertain whether the principal components selected in 2019, 2020, 2021, and 2022 have a partial impact on the company's profitability. The results of the partial test are presented below.

a. Partial Test 2019

Table 15. Partial Test Results for 2019

	Coefficient	t	Significance
Constant	-0.864	-3.501	0.001
PC ₁	-0.356	-1.425	0.162
PC ₂	0.442	1.771	0.084***
PC ₃	0.445	1.782	0.083***
PC ₄	-0.118	-0.471	0.640

*Significant at 1%, **Significant at 5%, ***Significant at 10%

b. Partial Test 2020

Table 16. Partial Test Results for 2020

	Coefficient	t	Significance
Constant	-0.482	-40.144	0.000
PC ₁	-0.334	-20.845	0.007*
PC ₂	0.342	20.909	0.006*
PC ₃	-0.065	-0.555	0.582
PC ₄	-0.021	-0.181	0.858

*Significant at 1%, **Significant at 5%, ***Significant at 10%

c. Partial Test 2021

Table 17. Partial Test Results for 2021

	Coefficient	t	Significance
Constant	-0.418	-30.935	0.000
PC ₁	-0.115	-10.066	0.293
PC ₂	0.121	10.125	0.268
PC ₃	0.053	0.497	0.622
PC ₄	0.274	20.546	0.015**
PC ₅	-0.025	-0.236	0.814

*Significant at 1%, **Significant at 5%, ***Significant at 10%

d. Partial Test 2022

Table 18. Partial Test Results for 2022

	Coefficient	t	Significance
Constant	-0.529	-30.232	0.003
PC ₁	-0.183	-10.106	0.275
PC ₂	0.232	10.403	0.169
PC ₃	-0.237	-10.435	0.160
PC ₄	-0.328	-10.982	0.055***
PC ₅	0.088	0.533	0.597

*Significant at 1%, **Significant at 5%, ***Significant at 10%

DISCUSSION

As can be seen in Table 13, the adjusted R-squared value for the year 2019 in this study is 0.096, which represents a 9.6% explanatory power. This indicates that PC₁ (current ratio, cash ratio, debt to assets ratio, and short-term debt), PC₂ (working capital turnover, total assets turnover, and fixed assets turnover), PC₃ (equity multiplier and tangible assets ratio), and PC₄ (cash holding level and firm age) explain company profitability in 2019 by 9.6%. The remaining 90.4% is explained by factors that are not included in the research model. This conclusion is further supported by the variance that can be explained by the four selected PCs for 2019 (Table 5), which indicates that the four PCs are able to explain 65.029% of the original data information. This indicates that 34.971% of the information remains unexplained by the selected PCs. This may indicate that the logic employed by previous researchers regarding the factors influencing firm profitability is not suitably applicable to the context of Fintech lending companies in Indonesia. The same interpretation also applies to the adjusted R-squared results for 2020, 2021, and 2022, as the adjusted R-squared value and variance

representation are not optimal. This may be due to the complexity of the determinants of company profitability and the potential influence of additional variables that have not been included in this research.

Furthermore, as shown in Table 14, the F-test value for 2019 is 0.094, which is less than the significance level of 0.10. In light of those results, it can be posited that H1 for 2019 is accepted. In other words, PC₁ (current ratio, cash ratio, debt to assets ratio, and short-term debt ratio), PC₂ (working capital turnover, total assets turnover, and fixed assets turnover), PC₃ (equity multiplier and tangible assets ratio), and PC₄ (cash holding level and firm age) exerted a simultaneous influence on the company's profitability in 2019. Subsequently, the F-test significance value for the 2020 data set is 0.006, which is less than the 0.05 significance. Based on the presented results, it can be concluded that H1 for 2020 is accepted. This signifies that PC₁ (current ratio, cash ratio, debt to assets ratio, short term debt ratio, and tangible assets ratio), PC₂ (total assets turnover, fixed assets turnover, and effective tax rate), PC₃ (cash ratio and cash holding level), and PC₄ (working capital turnover) simultaneously affect company profitability in 2020.

Moreover, it is established that the F-test significance value for 2021 is 0.129, which is greater than the significance values of 0.01, 0.05, or 0.10. In light of these findings, it can be posited that H1 for 2021 is rejected. This indicates that PC₁ (debt to assets ratio, short term debt ratio, and tangible assets ratio), PC₂ (working capital turnover, equity multiplier, and effective tax rate), PC₃ (current ratio and cash ratio), PC₄ (total assets turnover and fixed assets turnover), and PC₅ (cash holding level and firm age) have no simultaneous effect on company profitability in 2021. Then, the significance value of the F test for 2022 is 0.119, greater than the significance value of 0.01, 0.05, or 0.10. Based on these results, it can be concluded that H1 for 2022 is rejected. This means that PC₁ (current ratio, cash ratio, debt to assets ratio, and short-term debt ratio), PC₂ (total assets turnover, fixed assets turnover, and effective tax rate), PC₃ (working capital turnover and equity multiplier), PC₄ (tangible assets ratio), and PC₅ (cash holding level and firm age) have no simultaneous effect on company profitability in 2022. On the other hand, as evidenced by Tables 9, 10, 11, and 12, the variable representing the first principal component, which is the component with the greatest data representation, for each year is derived from liquidity, solvency, and activity ratios.

Furthermore, as evidenced in Table 15, the principal components that exert a partial and significant influence on the company's profitability in 2019 are PC₂ (working capital turnover, total assets turnover, and fixed assets turnover) and PC₃ (equity multiplier and tangible assets ratio). This implies that H2 2019 for PC₂ dan PC₃ is accepted. Table 16 indicates that the principal components that partially significantly affect the company's profitability in 2020 are PC₁ (current ratio, cash ratio, debt to assets ratio, short term debt ratio, and tangible assets ratio) and PC₂ (total assets turnover, fixed assets turnover, and effective tax rate). This implies that H2 2020 for PC₁ dan PC₂ is accepted. Table 17 indicates that the principal component that partially significantly affects the company's profitability in 2021 is PC₄ (total assets turnover and fixed assets turnover). These findings suggest

that H2 2021 for PC₄ is accepted. Table 17 indicates that the principal component that partially significantly affects the company's profitability in 2022 is PC₄ (tangible assets ratio). These findings suggest that H2 2022 for PC₄ is accepted. Based on the variables that are part of the principal component that has a significant effect on the company's profitability, it can be concluded that the variables current ratio, cash ratio, working capital turnover, debt to assets ratio, short term debt ratio, equity multiplier, total assets turnover, fixed assets turnover, tangible assets ratio, and effective tax rate are determinants of company profitability.

CONCLUSIONS AND RECOMMENDATIONS

A principal component analysis (PCA) and multiple linear regression were conducted on Fintech lending companies in Indonesia to determine the determinants of company performance. The results indicated that the variables of current ratio, cash ratio, working capital turnover, debt to assets ratio, short-term debt ratio, equity multiplier, total assets turnover, fixed assets turnover, tangible assets ratio, and effective tax rate formed principal components with significant effects on the profitability of Fintech Lending companies in Indonesia. Moreover, the primary principal component, which represents the greatest variance in the data set, is composed each year of variables belonging to the liquidity, solvency, and activity ratio categories. It can thus be concluded that the soundness of a company's liquidity, solvency structure, and operational efficiency are the main factors to consider when evaluating the profitability of Fintech lending companies in Indonesia. Additionally, the cumulative variance value of the PCA test results and the adjusted R-squared value of the multiple linear regression results indicate that the independent variables used in this research did not fully explain the company's profitability.

The findings of this study indicate that Fintech Lending companies in Indonesia may wish to consider evaluating current ratio, cash ratio, working capital turnover, debt to assets ratio, short-term debt ratio, equity multiplier, total assets turnover, fixed assets turnover, tangible assets ratio, and effective tax rate to enhance their profitability. These factors also need to be considered by stakeholders of fintech lending companies in Indonesia to be used as a consideration to gain an overview of the prospects and risks associated with fintech lending in Indonesia.

FURTHER STUDY

This study is limited by the fact that the independent variables used have limited explanatory power with regard to the profitability of Fintech lending companies in Indonesia. This is reflected in the adjusted R-squared value and the low variance representation. Accordingly, it is recommended that future studies consider the addition of new variables, such as quick ratio, cash coverage, inventory turnover, board diversity, and other variables that are believed to affect the company's profitability. Furthermore, future research could attempt to employ a time series approach and focus on a few specific companies.

REFERENCES

- Agustin, O., Anwar, Y., & Bramana, S. M. (2023). Analisis Rasio Profitabilitas Terhadap Optimalisasi Laba Pada PT Grand Titian Residence. *Jurnal Media Wahana Ekonomika*, 20(1), 202–215. <https://doi.org/https://doi.org/10.31851/jmwe.v20i1.9395>
- Akhund, S. A., & Qazi, L. T. (2023). Nonlinear Impact of Excess Working Capital on the Firm Performance. *Business & Economic Review*, 15(1), 105–128.
- Anton, S. G., & Nucu, A. E. A. (2021). The Impact of Working Capital Management on Firm Profitability: Empirical Evidence from the Polish Listed Firms. *Journal of Risk and Financial Management*, 14(9), 1–14. <https://doi.org/https://doi.org/10.3390/jrfm14010009>
- Azam, M., & Wang, M. (2020). The Effects of Tax Avoidance on Corporate Value. *Research Journal of Finance and Accounting*, 11(4), 118–125.
- Budi, A. D. A. S., Septiana, L., & Mahendra, B. E. P. (2024). Memahami Asumsi Klasik dalam Analisis Statistik: Sebuah Kajian Mendalam tentang Multikolinearitas, Heterokedastisitas, dan Autokorelasi dalam Penelitian. *Jurnal Multidisiplin West Science*, 3(1), 1–11. <https://doi.org/https://doi.org/10.58812/jmws.v3i01.878>
- Chintha, S. S., & Prasad, K. V. (2021). A Study on the Impact of Cash Management on the Financial Performance of the Listed Manufacturing Companies from Muscat Securities Market, Sultanate of Oman. *International Journal of Business and Administrative Studies*, 7(1), 25–35. <https://doi.org/10.20469/ijbas.7.10003-1>
- Doan, T.-T. T. (2020). The Effect of Cash Holdings on Firm Performance: Evidence from Vietnam Listed Firms. *Accounting*, 6(5), 721–726. <https://doi.org/http://dx.doi.org/10.5267/j.ac.2020.6.012>
- Fitriyana, R. F., Rikumahu, B., Widiyanesti, S., & Alamsyah, A. (2020). Principal Component Analysis to Determine Main Factors Stock Price of Consumer Goods Industry. *2020 International Conference on Data Science and Its Applications (ICoDSA)*, 1–5. <https://doi.org/https://doi.org/10.1109/ICoDSA50139.2020.9212845>
- Foong, J. K., En, J. N. J., Pei, J. P. P., Loon, C. W., & Siang, W. Y. (2021). Capital Structure and Firm Performance: Evidence from Malaysian Public Listed Plantation Companies. *UNIMAS Review of Accounting and Finance*, 5(1), 116–135. <https://doi.org/https://doi.org/10.33736/uraf.3536.2021>

- Gazi, M. A. I., Alam, M. S., Hossain, G. M. A., Islam, S. N., Rahman, M. K., Nahiduzzaman, M., & Hossain, A. I. (2021). Determinants of Profitability in Banking Sector: Empirical Evidence from Bangladesh. *Universal Journal of Accounting and Finance*, 9(6), 1377-1386. <https://doi.org/10.13189/ujaf.2021.090616>
- Hidayat, I., & Dewi, F. O. S. (2023). The Effect of Liquidity, Leverage, and Working Capital Turn on Profitability. *APTISI Transactions on Management (ATM)*, 7(1), 60-68.
- 0
- Ikhwani, A., & Suhendi, C. (2024). Pengaruh Rasio Aktivitas, Likuiditas, Leverage dan Profitabilitas terhadap Nilai Perusahaan yang Terdaftar di Jakarta Islamic Index (JII) Periode 2018-2021. *Jurnal Ilmiah Sultan Agung*, 3(1), 95-104.
- Liu, L., Zhou, X., & Xu, J. (2024). Does Working Capital Management Improve Financial Performance in China's Agri-Food Sector during COVID-19? A Comparison with the 2008 Financial Crisis. *PLoS ONE*, 19(4), 1-18. <https://doi.org/https://doi.org/10.1371/journal.pone.0300217>
- Msomi, T. S., & Nzama, S. (2023). Analyzing Firm-Specific Factors Affecting the Financial Performance of Insurance Companies in South Africa. *Insurance Markets and Companies*, 14(1), 8-21. [https://doi.org/http://dx.doi.org/10.21511/ins.14\(1\).2023.02](https://doi.org/http://dx.doi.org/10.21511/ins.14(1).2023.02)
- Nafis, B., & Sebrina, N. (2023). Pengaruh Pandemi Covid-19 dan Karakteristik Perusahaan terhadap Manajemen Laba Akrua. *Jurnal Eksplorasi Akuntansi*, 5(1), 83-100. <https://doi.org/https://doi.org/10.24036/jea.v5i1.616>
- Ngatno, Apriatni, E. P., & Youlianto, A. (2021). Moderating Effects of Corporate Governance Mechanism on the Relation between Capital Structure and Firm Performance. *Cogent Business & Management*, 8(1), 1-22. <https://doi.org/https://doi.org/10.1080/23311975.2020.1866822>
- Paringga, A. M., & Kurniawati, O. (2022). The Effect Of Quick Ratio Debt To Ratio And Fixed Assets Turnover On Financial Performance In The Food And Beverage Sub Sector Of Manufacturing Companies Listed In Indonesian Stock Exchange. *MM17: Jurnal Ilmu Ekonomi Dan Manajemen*, 9(2), 137-145. <https://doi.org/https://doi.org/10.30996/jmm17.v9i02.7044>
- Phuong, T. T. A., & Anh, N. T. H. (2022). The Impact of Capital Structure on the Profitability of Vietnamese Listed Banks. *International Journal of Management*

- and Economics Invention*, 8(5), 2424–2428.
<https://doi.org/https://doi.org/10.47191/ijmei/v8i5.02>
- Prasetya, Y. B., & Suwarno, A. E. (2024). Pengaruh Ukuran Perusahaan, Umur Perusahaan, Profitabilitas, dan Leverage Terhadap Kinerja Keuangan. *Economics and Digital Business Review*, 5(1), 329–374.
- Purba, J. H. V., & Bimantara, D. (2020). The Influence of Asset Management on Financial Performance, with Panel Data Analysis. *Proceedings of the 2nd International Seminar on Business, Economics, Social Science and Technology (ISBEST 2019)*, 150–155.
<https://doi.org/https://doi.org/10.2991/aebmr.k.200522.031>
- Roni, S. M., & Djajadikerta, H. G. (2021). *Data Analysis with SPSS for Survey-based Research*. Springer Nature Singapore Pte Ltd.
- Sitorus, K. L., Yuniati, T., & Prayogo, B. (2024). Analisis Rasio Keuangan untuk Menilai Kinerja Keuangan pada PT Indofood Sukses Makmur Tbk Periode 2019-2022. *Indonesian Journal of Economics and Strategic Management*, 2(1), 875–889.
- Sukamulja, S. (2019). *Analisis Laporan Keuangan sebagai Dasar Pengambilan Keputusan Investasi* (1st ed.). ANDI.
- Sutrisno, Y. A. E., & Riduwan, A. (2022). Pengaruh Ukuran Perusahaan, Umur Perusahaan, Kepemilikan Institusional, dan Kepemilikan Manajerial Terhadap Kinerja Keuangan Perusahaan. *Jurnal Ilmu dan Riset Akuntansi*, 11(11), 1–22.
- Tekin, B. (2021). The Factors Affecting the Market Value/Book Value and Profitability of REITs in Turkey. *International Real Estate Review*, 24(3), 469–499.
- Wardhana, A., Pradana, M., Kartawinata, B. R., & Akbar, A. (2023). *Financial Technology 4.0 Indonesia Perspective 2023* (1st ed.). Eureka Media Aksara.
- Widodo, A., & Yusiana, R. (2021). *Metodologi Penelitian: Penentuan Metode dengan Pendekatan Partial Least Square - Structural Equation Modeling (PLS-SEM)* (1st ed.). PT Refika Aditama.
- Zahra, H. F., Annisa, G. N., Sandy, N. C., Fathi, N. F., & Wijaya, S. (2024). Manajemen Perpajakan di Industri Alat Berat. *Jurnalku*, 4(1), 89–100.
<https://doi.org/https://doi.org/10.54957/jurnalku.v4i1.745>