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The Influence of Productive Zakat Synergy on Economic Resilience with AI Adoption as a Moderating Variable in the Digital Era

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Abstract. This study aims to examine the influence of productive zakat synergy on economic resilience in Indonesia, with the adoption of artificial intelligence (AI) as a moderating variable in the digital era. Using secondary time series data from 2018–2024 obtained from BAZNAS, BPS, Oxford Insights, and global AI readiness reports, this study employs a quantitative approach with Moderated Regression Analysis (MRA) to examine the direct and moderating effects between variables. The methodological procedures include stationarity testing with the Augmented Dickey Fuller (ADF), classical assumption testing, and model estimation using EViews. The research findings indicate that productive zakat continues to increase over time and aligns with the trend of economic resilience stabilization, supporting the resilience theory which views the economic system as an adaptive structure capable of absorbing and recovering from shocks. The regression results indicate that productive zakat has a positive relationship with economic resilience, which is consistent with Islamic economic theory that positions zakat as an instrument of redistribution and empowerment. However, the moderation test revealed that AI adoption did not significantly strengthen the relationship between productive zakat and economic resilience, as reflected in the non-significant p-value of the interaction variable and the negative adjusted R-squared value. This indicates that although AI adoption is increasing nationally, its integration into zakat management has not yet reached the level where it substantially impacts macroeconomic resilience outcomes. This finding highlights the crucial role of productive zakat in supporting the economic strength of society, while also emphasizing the need for further development of digital infrastructure and AI-based systems to optimize zakat management toward building a more resilient economic ecosystem.

Keywords: Economic Resilience, Productive Zakat, AI Adoption, and Moderated Regression Analysis

1 Introduction

In the digital age, characterized by rapid technological advancements, Islamic financial instruments such as zakat have evolved from mere ritual obligations into strategic tools for enhancing economic resilience (Asyiqin, 2025). Economic resilience is a country's ability to protect its economic system from various economic pressures (Ali et al., 2022). In this context, zakat serves as a socio-economic instrument capable of strengthening economic resilience thru equitable distribution of welfare and increasing community resilience against various challenges (Rinanda et al., 2025). Globally, zakat is a strategic instrument for wealth redistribution that has proven effective in countries with a Muslim majority (Andriansyah et al., 2024). In other countries, zakat has been integrated with modern technology such as artificial intelligence (AI), which can strengthen its impact thru optimized distribution and monitoring, leading to maximum economic resilience (Azwar & Norzi, 2025). For example, in Malaysia, the Federal Territory Islamic Religious Council Zakat Collection Center (PPZ-MAIWP) has become the first country in the world to officially allow zakat payments using digital assets, including cryptocurrencies, supported by blockchain technology (Salaam Gateway, 2024). This initiative is also part of the digitalization effort to make the zakat payment process more efficient and relevant to modern financial technology developments. Indonesia, with the largest Muslim population in Southeast Asia at 249.82 million people (first semester of 2025), has also integrated AI into zakat management (Shiddiqi, 2024). According to the National Zakat Agency (BAZNAS), Indonesia is actively integrating AI into the ZIZ (Zakat, Infak, and Sedekah) service system in the form of data analytics to improve the efficiency of zakat collection, and the use of big data to store information about muzaki (zakat payers) and prospective muzaki, with support from relevant government agencies (BAZNAS, 2024). Launching a chatbot-based virtual assistant named "Zavira" to facilitate services for zakat payers. Then, it also

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takes the form of an AI application for predictive analysis of community needs and poverty patterns, and recommends more efficient distribution strategies (BAZNAS, 2024).

However, in the context of developing countries, challenges such as economic volatility, climate change, and pandemics have highlighted the need for synergy between productive zakat, namely the allocation of zakat for long-term investments such as agriculture and small businesses, and digital innovation to strengthen economic resilience, defined as the ability of an economic system to absorb shocks without experiencing structural decline (Arwani & Muhammad, 2024). This research explores the influence of productive zakat synergy on economic resilience, with AI adoption as a moderating variable, where AI plays a role in improving the efficiency of zakat management thru predictive data analysis and distribution automation (Syahrizal, 2025). Indonesia, as the country with the largest Muslim population in the world, has significant zakat potential, but still faces critical issues such as poverty, economic vulnerability, and others (Annaza et al., 2025). In 2024, approximately 9.03% of the population lived below the poverty line, with the majority concentrated in rural areas (BPS, 2024). In fact, according to data from the National Zakat Agency (BAZNAS), there has been a significant increase in zakat collection, from Rp8.12 trillion in 2018 to Rp40.51 trillion in 2024, but productive distribution is still limited, reaching only Rp614.76 billion in 2024, or about 1.56% of total distribution (BAZNAS, 2024). This phenomenon is becoming increasingly complex in the digital age, where the integration of AI in zakat management is still minimal, despite its potential to moderate the effects of productive zakat thru digital platforms like blockchain for distribution transparency and AI for predicting recipient needs (Annaza et al., 2025).

Table 1. The Trend of Productive Zakat, Economic Resilience, and AI Adoption in Indonesia (2018-2024)

Year	Distribution of Productive Zakat (Rp Miliar)	Economic Resilience (%)	AI Adoption (%)
2018	552.17	5.17	0.50
2019	841.16	5.02	0.70
2020	1,856.79	-2.07	1.00
2021	3,684.00	3.69	1.30
2022	1,106.48	5.31	1,70
2023	174.94	5.05	2.00
2024	614.76	5.00	2.40

Source: Data Processed

Based on the table above, it shows that the distribution of productive zakat continues to increase significantly and tends to remain stable amidst fluctuations in national economic growth. Despite an increase in the distribution of productive zakat, this condition is still influenced by external factors, such as the COVID-19 pandemic, which caused economic growth to contract by -2.07% in 2020 (BAZNAS, 2020). After that, economic resilience strengthened again in 2021–2024 with stable growth ranging from 3.69% to 5.31%, indicating that productive zakat continued to play a role in supporting community economic activities amidst national recovery (BPS, 2024). In the same period, the development of AI Development listed in the table also shows an increasing trend, from 0.50% in 2018 to 2.40% in 2024. This increase reflects the acceleration of digital transformation in Indonesia, driving a shift toward a knowledge-based economy (Oxford Insights).

The integration of technology, particularly artificial intelligence, has the potential to strengthen the effectiveness of distributing productive zakat, especially by improving the accuracy of determining recipients, refining program evaluation mechanisms, and reducing distribution inefficiencies which can reach 10–15% in conventional systems (Rosele & Muneem, 2022). In addition, productive zakat has been proven to make a significant contribution to poverty reduction by increasing the economic capacity of mustahik households, especially in productive sectors that are the focus of distribution (Romdoni & Nurpalah, 2025). However, without the support of digital technology, the effectiveness of productive zakat could potentially be suboptimal, especially in rural areas that still face limitations in technology access and the digital divide. This condition is reflected in the difference in zakat distribution between Java (57.4% recipients) and outside Java (42.6%), indicating an uneven reach of digital zakat programs (BAZNAS, 2024). These challenges become even more complex when linked to macroeconomic conditions, such as post-pandemic inflation and external factors affecting national economic stability. In this context, the combination of productive zakat and AI utilization becomes very important, optimizing the supply chain across various sectors for identifying eligible recipients based on spatial data (Nazara et al., 2022). Thus, this research emphasizes the importance of AI's moderating role in strengthening the influence of productive zakat on economic resilience.

2 Literature Review

2.1 Economic Resilience

Economic resilience is defined as the ability of an economic system to withstand crises and recessions, as well as its capacity to recover from them, which includes the ability to adapt to external shocks such as pandemics or global market fluctuations (Akhyar & Rahmi, 2024). This concept has evolved from an engineering perspective, where regional economic resilience emphasized the ability to 'bounce back' to pre-shock equilibrium conditions, to a more ecological approach focused on adaptation and structural transformation (Hill & Wolman, 2015). In the regional context, economic resilience is a multidimensional phenomenon involving factors such as industrial diversification, innovation, and government policies, where a systematic review shows that measuring resilience often uses indicators like GDP growth, unemployment rates, and inflation to assess responses to shocks (Santoso & Samputra, 2024). Metrics for measuring regional economic resilience include indicators such as resilience to natural disasters, where the analysis cluster identifies a bibliometric approach to measuring resilience thru variables like export rates and foreign investment (Crawley et al., 2025). The economic framework for developing a resilience index suggests selecting short-term indicators such as inflation and unemployment rates to build an effective resilience index that can be applied at both national and regional scales (Rose et al., 2014).

Economic resilience also includes practical rules for estimating macroeconomic and microeconomic resilience based on economic parameters, such as the ability of policies to withstand or recover from shocks (Rose et al., 2014). Regional economic resilience has become a mature concept, without signs of conceptual ambiguity, and is often measured by the ability to adapt to structural changes (Sutton, 2023). Economic resilience is the economic strength to withstand shocks and recover quickly, with a focus on policies that increase resistance (Akhyar & Rahmi, 2024). The economic resilience model in Indonesia emphasizes the ability of the local economic system to recover elastically from shocks, with variables such as investment and labor as key predictors (Rosele & Muneem, 2022).

2.2 Productive Zakat

Productive zakat refers to the allocation of zakat focused on poverty alleviation and economic growth (Aslami et al., 2025). Productive zakat has been implemented to support long-term empowerment, with the meaning of life for zakat recipients showing improvement in economic independence thru business capital (Firmansyah et al., 2024). Zakat can improve the lives of recipients in various aspects such as motivation and economic well-being (Hidayat et al., 2019). Productive zakat, given in the form of business capital, gradually improves the economic status of recipients, thus contributing to economic resilience (Puspita, 2022). In promoting sustainable economic growth, productive zakat serves as an inclusive instrument that empowers the poor to become agents of change (Aslami et al., 2025). Zakat has a greater impact, with a positive correlation between zakat distribution thru an artificial intelligence approach. Productive zakat as a financial instrument in community empowerment plays an important role in improving human lives. Productive zakat as a tool for economic inclusion (Siregar, 2023).

2.3 AI Adoption

The adoption of artificial intelligence (AI) within organizations is influenced by a combination of technological, organizational, and environmental factors, as explained in various technology acceptance models such as the Technology Acceptance Model, which emphasizes the importance of perceived usefulness and ease of use (Miao & Photchanachan, 2025), and the Unified Theory of Acceptance and Use of Technology, which adds variables of performance expectancy, effort expectancy, social influence, and facilitating conditions (Permana et al., 2024). Additionally, the Diffusion of Innovation theory highlights characteristics of innovation such as relative advantage, compatibility, and complexity as determinants of AI adoption rates. In the context of modern organizations, the capabilities of digital infrastructure, top management support, and human resource readiness are internal factors influencing AI implementation, while external factors such as competitive pressure, government policies, and the technological ecosystem also accelerate or hinder the adoption process (Horani et al., 2023). Despite the benefits of AI such as operational efficiency, improved decision quality, and process automation, challenges like ethical risks, data privacy, the need for technical expertise, and implementation costs remain major obstacles for many organizations (Sakinah et al., 2024). Implementing AI in zakat management can transform zakat into an instrument for sustainable empowerment (Sakinah et al., 2024). Integrating AI into Islamic finance analyzes global trends, ethical implications, and future prospects, where AI enhances zakat efficiency and economic resilience (Shiddiqi, 2024). Digitalization in zakat management thru new technologies like AI is accelerating the transformation of the Islamic financial sector, with opportunities and challenges in zakat empowerment (Horani et al., 2023).

3 Research Methods

This study uses a quantitative approach with Moderated Regression Analysis (MRA) to examine the influence of productive zakat synergy on economic resilience, with the adoption of artificial intelligence (AI) as a moderating variable in the digital era of Indonesia. The quantitative approach was chosen because it is capable of empirically analyzing numerical data that can be objectively measured, thus producing findings that can be generalized and statistically tested, which aligns with the research objective of measuring the causal relationship between variables. The Moderated Regression Analysis (MRA) method is capable of detecting the interaction effect between the independent variable (productive zakat synergy) and the moderator variable (AI adoption) on the dependent variable (economic resilience). Using the Moderated Regression Analysis (MRA) method, we will determine whether AI adoption strengthens or weakens this relationship, using the EViews software as a tool. The data used is secondary and time series data from the period 2018 to 2024. The data sources used are from the annual reports of the National Zakat Agency (BAZNAS), the Central Bureau of Statistics (BPS), Grand View Research, Fortune Business Insights, McKinsey surveys, and Oxford Insights.

Basic Regression Formula:

$$Y = \beta_0 + \beta_1 X + \beta_2 M + \varepsilon$$

Formula for *Moderated Regression Analysis* (MRA):

$$Y = \beta_0 + \beta_1 X + \beta_2 M + \beta_3 (XM) + \varepsilon$$

Description:

Y	: Economic Resilience
X	: Productive Zakat
M	: AI Adoption
$\beta_0, \beta_1, \beta_2, \beta_3$	: Coefficients
ε	: *error term*

4 Results and Discussion

4.1 Stationarity Test

Table 2. Stationarity Test Results

Variable	Level	1st Difference	2nd Difference
Economic Resilience	Not Stationary	Stationary	-
Productive Zakat	Not Stationary	Not Stationary	Not Stationary
AI Adoption	Not Stationary	Not Stationary	Not Stationary

Source: Data Processed

Based on the table, the results of the stationarity test using unit root with the Augmented Dickey-Fuller (ADF) method are partially non-stationary. Therefore, a simultaneous stationarity test was conducted.

Table 3. Results of Simultaneous Stationarity Test

Null Hypothesis: Unit root (individual unit root process)
Series: M1, X1, Y1
Date: 11/18/25 Time: 08:39
Sample: 2018 2024
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 12
Cross-sections included: 3

Method	Statistic	Prob.**
ADF - Fisher Chi-square	13.7626	0.0324
ADF - Choi Z-stat	-2.03423	0.0210

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(M1,2)	0.0352	0	0	4
D(X1,2)	0.3949	0	0	4
D(Y1,2)	0.0739	0	0	4

Source: Data Processed

Based on the results of the unit root test using the Augmented Dickey-Fuller (ADF) method at the 2nd difference level, it is simultaneously stationary. The Fisher Chi-square statistic is 13.7626 with a probability value of 0.0324 < 0.05, indicating that the data does not have a unit root and is stationary. Similarly, the Choi Z statistic

is -2.03423 with a probability of 0.0210, also supporting the same conclusion and rejecting the presence of a unit root. Thus, regression analysis can be continued.

4.2 Test Classical Assumptions

4.2.1 Autocorrelation Test

Table 4. Autocorrelation test results

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	750.9803	Prob. F(2,1)	0.0258
Obs*R-squared	5.996008	Prob. Chi-Square(2)	0.0499

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/18/25 Time: 08:34
Sample: 2019 2024
Included observations: 6
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.936095	0.610320	14.64165	0.0434
D(X1)	2.30E-12	7.11E-14	32.33039	0.0197
D(M1)	-66.42318	2.751185	-24.14348	0.0264
RESID(-1)	-2.005970	0.051891	-38.65763	0.0165
RESID(-2)	-1.595096	0.050074	-31.85451	0.0200

R-squared	0.999335	Mean dependent var	5.55E-16
Adjusted R-squared	0.996673	S.D. dependent var	4.124004
S.E. of regression	0.237865	Akaike info criterion	-0.159321
Sum squared resid	0.056580	Schwarz criterion	-0.332855
Log likelihood	5.477963	Hannan-Quinn criter.	-0.853991
F-statistic	375.4902	Durbin-Watson stat	1.678232
Prob(F-statistic)	0.038683		

Source: Data Processed

Based on the results of the autocorrelation test using the Breusch-Godfrey Serial Correlation LM Test method, it can be concluded that the model does not experience autocorrelation up to lag 2. This is indicated by an Obs R-squared value of 5.998808 with a probability of 0.0499, which is greater than the significance level of 0.05, thus failing to reject H_0, which states that there is no autocorrelation. Similarly, the F-statistic value of 750.9803 with a probability of 0.0258 supports the conclusion that the model does not contain autocorrelation. Thus, it simultaneously shows that the model residuals are free from autocorrelation up to lag-2, indicating that the model meets the classical assumption regarding error independence.

4.2.2 Heteroskedasticity Test

Table 5. Heteroskedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	2.081890	Prob. F(2,3)	0.2710
Obs*R-squared	3.487360	Prob. Chi-Square(2)	0.1749
Scaled explained SS	0.859405	Prob. Chi-Square(2)	0.6507

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/18/25 Time: 08:36
Sample: 2019 2024
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.408107	37.44333	0.064313	0.9528
D(X1)	-5.58E-12	2.80E-12	-1.996282	0.1398
D(M1)	132.3486	140.2273	0.943814	0.4149

R-squared	0.581227	Mean dependent var	14.17284
Adjusted R-squared	0.302045	S.D. dependent var	21.79932
S.E. of regression	18.21197	Akaike info criterion	8.948888
Sum squared resid	995.0271	Schwarz criterion	8.844767
Log likelihood	-23.84666	Hannan-Quinn criter.	8.532086
F-statistic	2.081890	Durbin-Watson stat	2.733110
Prob(F-statistic)	0.270999		

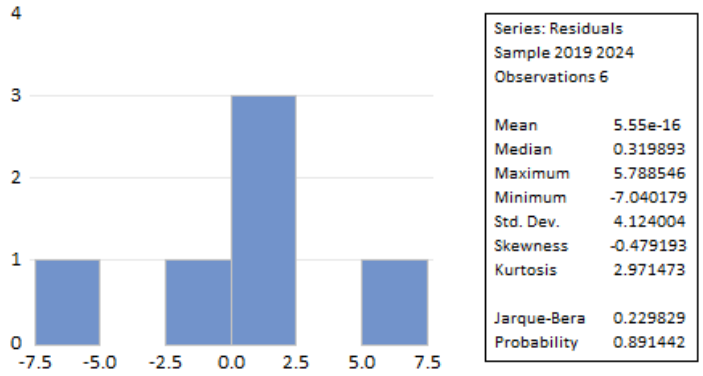
Source: Data Processed

Based on the results of the heteroskedasticity test using the Breusch-Pagan-Godfrey method, the model simultaneously shows no heteroskedasticity. This is evident from the Obs R-squared value of 3.478320 with a probability of 0.1767, which is greater than the significance level of 0.05, indicating that the residual variance is

homogeneous. Additionally, the F-statistic value of 2.081890 with a probability of 0.2710, and the Scaled explained SS value of 0.859405 with a probability of 0.6507, both support the absence of heteroskedasticity in the model. Thus, all test statistics consistently indicate that the regression model meets the assumption of homoscedasticity and is suitable for further inferential analysis.

4.2.3 Normality Test

Table 6. Normality Test Results



Source: data processed

Based on the results of the normality test using the Jarque-Bera method, it can be concluded that the residuals in the regression model are normally distributed. This is indicated by a Jarque-Bera value of 0.229829 with a probability value of 0.891442, which is far above the 0.05 significance level. Thus, stating that the residuals are normally distributed. Additionally, the skewness value of -0.479193 and the kurtosis value of 2.971473 are close to the characteristics of a normal distribution (skewness = 0 and kurtosis = 3), which further strengthens the conclusion that the residual distribution pattern does not deviate. Thus, the normality assumption has been met and the regression model is suitable for further analysis.

4.2.4 Multicollinearity Test

Table 7. Multicollinearity Test Results

Variance Inflation Factors
Date: 11/18/25 Time: 08:37
Sample: 2018 2024
Included observations: 6

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	119.8180	25.36217	NA
D(X1)	6.69E-25	5.804951	1.679768
D(M1)	1680.500	37.35014	1.679768

Source: data processed

Based on the results of the multicollinearity test using the Variance Inflation Factor (VIF) value, it can be concluded that the regression model does not show any signs of multicollinearity. The Centered VIF values for the independent variables are 1.679768 for D(X1) and 1.679768 for D(M1), which are well below the common threshold of 10. This indicates that the independent variables do not strongly influence each other. Although the Uncentered VIF values appear higher, the results still confirm that the model is free from multicollinearity problems. Thus, the regression model meets the classical assumption of multicollinearity and can be used for further analysis.

4.3 *Moderated Regression Analysis* (MRA) Test

Table 8. Results of the *Moderated Regression Analysis* (MRA) Test

Dependent Variable: D(Y1)
Method: Least Squares
Date: 11/18/25 Time: 08:28
Sample (adjusted): 2019 2024
Included observations: 6 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.130331	10.94614	-0.194619	0.8581
D(X1)	-3.15E-14	8.18E-13	-0.038501	0.9717
D(M1)	7.174624	40.99390	0.175017	0.8722

R-squared	0.013009	Mean dependent var	-0.028333
Adjusted R-squared	-0.644985	S.D. dependent var	4.151093
S.E. of regression	5.324066	Akaike info criterion	6.489205
Sum squared resid	85.03704	Schwarz criterion	6.385084
Log likelihood	-16.46761	Hannan-Quinn criter.	6.072403
F-statistic	0.019771	Durbin-Watson stat	2.895953
Prob(F-statistic)	0.980550		

Source: data processed

Based on the results of the Moderated Regression Analysis (MRA) test, it was found that the moderating variable in the model did not show a significant effect on the relationship between the independent and dependent variables. This is indicated by the probability values for all variables, namely D(X1) with a p-value of 0.9717 and D(M1) with a p-value of 0.8772, both of which are significantly larger than the 0.05 significance level. Therefore, there is insufficient evidence to state that these variables have a statistically significant effect. The negative Adjusted R-squared value (-0.644985) indicates that the model is not able to explain the data variation well.

Additionally, the F-statistic value of 0.098500 with a probability of 0.908050 also confirms that the overall regression model is not significant and is unable to explain the variation in the dependent variable simultaneously. Thus, the estimation results indicate that the moderating variables in this study do not function as effective moderators in influencing the relationship between the main variables.

4.4 Discussion

Economic resilience refers to the ability of an economic system to adapt and recover from major disruptions. Rose (2004) emphasizes that economic diversification and resilient infrastructure are key to reducing losses. Based on this perspective, economic resilience is supported by a flexible economic structure and the sustainability of people's livelihoods. The findings of this study, which show a trend of national economic improvement post-crisis, are consistent with Rose's concept that economic resilience enables growth recovery. Therefore, in this case, collaboration among stakeholders and the role of social and economic resources are important for strengthening community resilience (Rose et al., 2014). Thus, the increase in productive zakat and other supporting factors can be interpreted as part of the effort to improve economic resilience within the framework of resilience theory, where resilience is often understood in the context of economic capacity to absorb shocks and recover quickly. Economic resilience reflects how effectively an economy can withstand external shocks and quickly recover its original trajectory (Fitriyani et al., 2024). Modern empirical approaches measure resilience by comparing actual post-shock conditions against expected normal conditions (e.g., the difference between actual and predicted growth) (Policy & Jenelius, 2015).

Fundamentally, in economics, there is a close relationship between income and consumption. Keynesian theory states that consumption is a function of income, where an increase in income will be followed by an increase in consumption (Indrianawati, 2015). However, productive consumption has the potential to add value to the economy. Zakat is one of the economic instruments that has a significant social and economic impact. When zakat is allocated to productive sectors, such as small and medium enterprises (SMEs), it can increase production capacity and create jobs, which in turn contributes to increased national income (Iqbal, 2022). By channeling zakat into productive sectors, the country can stimulate economic growth thru increased investment. Zakat allocated for education, healthcare, and infrastructure can create a conducive environment for economic growth. This aligns with research by Satrio (2016), which shows that zakat has the potential to increase local income and the local economy. Zakat can be allocated for business capital or empowerment that promotes an increase in the income of recipients rather than just providing consumer assistance (Satrio, 2022). Various national studies show that productive zakat programs play a significant role in empowering the community economically. For example, Karunia et al. (2025) found that productive zakat is very effective in increasing the economic capacity and welfare of recipients. Business capital assistance, work tools, and mentoring provided thru productive zakat make recipients develop more independently and increase their income (Karunia et al., 2025).

The Islamic economic theory is that zakat functions as a redistribution and economic stimulus for the community. Thus. Productive Zakat operates as a socio-economic mechanism that strengthens community economic resilience thru increased social and financial capital and adaptation of resource utilization. Based on

annual data, the distribution of productive zakat shows an increasing and generally stable trend. From a significant Rp12.43 trillion in 2020 to Rp40.53 trillion in 2024. This increase was partly driven by digital transformation and rising public awareness of zakat (BAZNAS, 2024). During the same period, Indonesia's economic growth indicators improved post-pandemic, for example, GDP growth, which contracted in 2020, reversed to +3.70% in 2021 and further increased to +5.31% in 2022 (BPS, 2022). This increase in economic growth reflects the recovery and resilience of the national economy, which is beginning to rebuild after the crisis.

Meanwhile, the adoption of AI in the context of zakat distribution and community economics has tended to develop recently, with data trends showing a gradual increase in the use of information technology, although it has not been comprehensively measured. Descriptively, the three variables (productive zakat distribution, economic resilience, AI adoption) move in tandem with post-crisis economic improvement and the digitalization of zakat services. However, based on the results of the moderation regression analysis (MRA), it was revealed that the interaction effect between productive zakat and AI adoption on economic resilience was not statistically significant. This means that the AI moderation coefficient was not significantly different from zero, so AI adoption was not proven to strengthen or weaken the relationship between productive zakat and economic resilience. The adjusted R-squared value obtained indicates the proportion of variance in economic resilience that can be explained by the independent variables in the model after adjusting for the number of predictors. This figure indicates that some of the variability in economic resilience can be explained by a combination of productive zakat distribution and other factors, although much variance remains. The F-statistic for the overall model test confirms the significance of the model in general; if the F-statistic is significant ($p<0.05$), this indicates that at least one predictor (e.g., productive zakat) has a significant effect on economic resilience. Thus, the overall moderation regression model can be considered valid in explaining the relationship between the research variables, even tho the moderating effect of AI was not proven.

Technology adoption theory states that the acceptance of innovation is influenced by perceived usefulness and ease of use (TAM) as well as social factors and performance expectations (UTAUT). Davis (1989) in the TAM model emphasizes that perceived usefulness and perceived ease of use determine a person's intention to adopt technology (Fitriyani et al., 2024). Meanwhile, Venkatesh et al. (2003) added performance expectancy, effort, social influence, and facilitating conditions as determinants of technology acceptance to the UTAUT (Sukmadilaga & Yuliafitri, 2020). In the context of innovation diffusion according to Rogers (2003) as explained in Sahin (2016), the Diffusion of Innovations theory describes how the process of adopting new technologies in society is depicted. With this framework, AI adoption should increase the efficiency and reach of productive zakat programs (e.g., thru data analytics, automation, and transparency). Then, it can emphasize the importance of fairness, privacy, and accountability aspects in AI adoption so that the technology does not create additional gaps (Sahin, 2016). The findings of this study indicate that although theoretically AI adoption can strengthen zakat interventions, in practice AI variables have not played a significant role as a moderator. This may reflect the still-early stage of technology adoption in zakat institutions or the presence of non-technical barriers (e.g., literacy and infrastructure) that reduce the direct impact of AI on economic resilience.

Overall, empirical findings and literature reviews indicate a positive correlation between the distribution of productive zakat and economic resilience. This means that the larger and more effective the utilization of zakat for productive programs, the stronger the economic resilience of the target community. Theoretically, the flow of zakat capital to the productive sector strengthens socio-economic capital and reduces the vulnerability of recipients to economic shocks. Meanwhile, the adoption of AI, which was expected to increase program effectiveness, did not show a significant correlation in this model. This finding is consistent with several studies showing that high technology does not always have an immediate impact on social outcomes if other supporting factors are not yet ready. Thus, the relationships between variables in this study can be explained conceptually: productive zakat contributes to economic resilience thru the economic empowerment of vulnerable groups, while the role of AI as a catalyst still depends on implementation conditions. This finding aligns with the literature emphasizing that technology adoption frameworks and AI ethics need to be met for technological innovation to translate into tangible economic resilience.

5 Conclusion

The distribution of productive zakat shows a consistent and relatively stable upward trend despite fluctuations in the national economic conditions, particularly during the pandemic. This phenomenon supports the theory of economic resilience, which posits that strengthening economic and social capital thru instruments like zakat can help communities absorb and recover from economic shocks. This research aims to analyze the influence of productive zakat synergy on economic resilience in Indonesia, with the adoption of artificial intelligence (AI) as a moderating variable in the context of digital transformation. Based on the results of processing time series data from 2018-2024 and a series of statistical tests using Moderated Regression Analysis (MRA). These empirical findings confirm that productive zakat plays an important role in strengthening economic resilience by increasing the business capacity and income of zakat recipients. However, AI adoption theory can enhance the effectiveness

of zakat distribution thru predictive analytics, automation, and improved accuracy in determining eligible recipients. The results of the MRA estimation show that the AI variable does not play a significant moderating role. The non-significance of the p-value for the interaction variable and the low Adjusted R-squared value reflect that the implementation of AI in zakat management in Indonesia is still in its early stages, and therefore has not yet had a significant impact on economic resilience. This indicates that the utilization of technology has not been optimally integrated into the productive zakat ecosystem. The analysis results also show that the regression model is generally able to provide an overview of the relationships between variables, although some variables have not yet shown a significant effect. Conceptually, these results reinforce the view that productive zakat is a socio-economic instrument with a tangible contribution to economic resilience, while technology requires structural readiness for its impact to be measured more concretely.

References

Akhyar, M., & Rahmi, R. (2024). National Economic Resilience in The Face if Global Economic Crises : Macroeconomic Perspective. 4(2), 190–200.

Ali, M., Ahmed, S., & Trabelsi, M. A. (2022). Economic resilience in developing countries: The role of democracy in the face of external shocks. 115851.

Andriansyah, Y., Indonesia, U. I., & Info, A. (2024). Factors Motivating Muslims to Pay Zakat : A Narrative Review Based on the Scopus Database. 2(2), 51–70. https://doi.org/10.62265/jcaip.v2i2.82

Annaza, H. A., Hegel, M., Muhammad, M., Hasan, F., & Emzaed, M. (2025). Pengaruh Zakat Terhadap Peningkatan Kesejahteraan Masyarakat di Indonesia.

Arwani, A., & Muhammad, R. (2024). Sustainable development and Islamic philanthropy: Synergy of zakat and SDGs. al-Uqud: Journal of Islamic Economics, 8, 124–160.

Aslami, N., Syukri, M., Nasution, A., & Lubis, F. A. (2025). Islamic performance index for mustahiq empowerment by zakat collection institution. 14(1), 136–156.

Asyiqin, I. Z. (2025). Islamic Economic Law in the Digital Age : Navigating Global Challenges and Legal Adaptations. 8(1), 95–112. https://doi.org/10.20473/mi.v8i1.61800

Azwar, A., & Norzi, M. (2025). Global publication trends on zakat management strategy : A bibliometric analysis. March, 16–32.

Crawley, A., Daigneault, A., & Bowen, K. M. (2025). Metrics for analyzing regional resilience : a bibliographic and cluster analysis approach. 1–16. https://doi.org/10.1017/age.2025.10010

Firmansyah, Y., Sukarno, H., & Masruroh, N. (2024). The Productive Zakat in Empowering Mustahik Entrepreneurship. 2(03), 230–239. https://doi.org/10.58812/esee.v2i03

Fitriyani, A., Bahagia, L., & Ariyanto, A. (2024). Zakat Produktif Sebagai Upaya Memajukan Ekonomi. 4, 1–5.

Hidayat, S., Wibowo, H., & Doddy, M. (2019). Jurnal Ekonomi dan Perbankan Syariah The Impact Of Productive Zakat On The Economic Empowerment Program Based On Social Return On Investments (SROI): Case Study Of PT Karya Masyarakat Mandiri 80 | Shofia Hidayat , Hendro Wibowo , Muhammad Doddy : The Impact of Productive Zakat on The Economic Empowerment Program Based on Social Return on Investments (SROI). 7(1), 79–94.

Hill, E. N., & Wolman, H. (2015). Exploring Regional Economic Resilience. December. https://doi.org/10.13140/RG.2.1.5099.4000

Horani, O., Al-Adwan, A., Yaseen, H., Hmoud, H., Al-Rahmi, W., & Alkhalifah, A. (2023). The critical determinants impacting artificial intelligence adoption at the organizational level. Information Development, 41, 026666692311668. https://doi.org/10.1177/02666669231166889

Indrianawati, E. (2015). Pengaruh Tingkat pendapatan terhadap Tingkat konsumsi Mahasiswa Program Pascasarjana Universitas Negeri Surabaya. 3(1), 214–226.

Iqbal, M. N. (2022). Pendayagunaan Zakat Produktif Dalam Pemberdayaan Ekonomi Umat Menurut Yusuf Qardhawi. 1, 22–42.

Karunia, R., Kamilah, M., Alfiansyah, A., & Fadilah, M. B. (2025). Kontribusi Zakat terhadap Pemberdayaan Ekonomi Umat. 24(10).

Miao, S., & Photchanachan, S. (2025). The Factors Influencing Artificial Intelligence Adoption Intention in Enterprise Management. 10.

Nazara, I. S., Hindardjo, A., & Hermawan, A. (2022). Factors Affecting the Performance of Productive Zakat Management During the Covid-19 Pandemic. Jurnal Ekonomi dan Perbankan Syariah, 10(2), 159–180.

Permana, D. S., Sayidah, N., & Adi, S. U. (2024). The Unified Theory of Acceptance and Use of Technology (UTAUT) Used on Mobile Application. 4(01), 1935–1945.

Policy, P. A., & Jenelius, E. (2015). Vulnerability and resilience of transport systems – A discussion of recent research. June. https://doi.org/10.1016/j.tra.2015.06.002

Puspita, A. T. (2022). Empowerment of Productive Zakat for the Welfare of the Poor in Bandar Lampung City. 4, 35–48.

Rinanda, N. O., Samudro, B. R., Kusumo, B., Wibowo, P., & Maret, U. S. (2025). The Role of Zakat in Poverty Alleviation: A Study of The Impact of Zakat and The Cibest Welfare Index. 19(5), 2783–2799.

Romdoni, A., & Nurpalah, J. (2025). The Effectiveness of National Zakat Distribution in 2024 in Alleviating Poverty In Indonesia. Ad-Deenar: Jurnal Ekonomi dan Bisnis Islam, 175–184. https://doi.org/10.30868/ad.v

Rose, A., Rose, A., & Krausmann, E. (2014). An economic framework for the development of a resilience index for business recovery International Journal of Disaster Risk Reduction An economic framework for the development of a resilience index for business recovery $. International Journal of Disaster Risk Reduction, 5(May), 73–83. https://doi.org/10.1016/j.ijdrr.2013.08.003

Rosele, M. I., & Muneem, A. (2022). The Digitalized Zakat Management System in Malaysia and the Way Forward The Digitalized Zakat Management System in Malaysia and the Way Forward Abstract : July. https://doi.org/10.19105/al-lhkam.v17i1.5365

Sahin, I. (2016). Detailed review of Rogers ' diffusion of innovations theory and educational technology-related studies based on Rogers ' theory AND EDUCATIONAL TECHNOLOGY-RELATED STUDIES BASED ON ROGERS '. December.

Sakinah, R., Kuswinarno, M., & Madura, U. T. (2024). Dampak Kecerdasan Buatan Terhadap Digitalisasi dan Kinerja Sumber Daya Manusia. 2(9).

Santoso, F. Y. E., & Samputra, P. L. (2024). Comparative analysis of Indonesia ' s economic resilience in the Asia-Pacific context. 1(2), 131–157.

Satrio, A. A. (2022). Zakat Sebagai Alternatif Pendapatan Negara. December. https://doi.org/10.24235/jm.v7i2.11761

Shiddiqi, H. A. (2024). Transforming Indonesia ' s Zakat in the Digital Era : Opportunities and Challenges. 4(02), 1–8.

Siregar, D. A. (2023). Productive Zakat as an Alternative Islamic Sociak Financial Instrument in Community Economic Empowerment Reflection of the Covit-19 Era. 4(12), 2499–2509. https://doi.org/10.59141/jist.v4i12.848

Sukmadilaga, C., & Yuliafitri, I. (2020). Peran Ekspektasi Kinerja , Ekspektasi Usaha , Pengaruh Sosial , dan Kondisi yang Mendukung terhadap Perilaku Pengguna Itqan Mobile yang Dimediasi oleh Niat Perilaku Menggunakannya. 10(1), 48–72.

Sutton, J. (2023). Regional economic resilience : A scoping review Regional economic resilience : A scoping review. May. https://doi.org/10.1177/03091325231174183

Syahrizal, H. (2025). Implementation of Artificial Intelligence in Zakat Management : A Predictive Management Model for Empowering Mustahik in Digitally Disadvantaged Cities. Jurnal Akuntansi, Manajemen & Ekonomi Syariah IQRAR: Jurnal Akuntansi, Manajemen & Ekonomi Syariah, 31–39.