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The Effect of Using QRIS in the Collection of Zakat, Infaq, and Alms on Economic Growth in Indonesia: An Econometric Analysis

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ABSTRACT

This study analyzes the dynamic relationship between the use of QRIS, the collection of zakat, infaq, and alms (ZIS), and economic growth in Indonesia. It contributes to the empirical understanding of ZIS as a key transmission channel linking digital payment innovation to macroeconomic growth. A quantitative approach was employed using the Vector Autoregression (VAR) model, which utilized quarterly data from 2019 to 2024. The procedures included stationarity tests, optimal lag selection, Granger causality tests, Variance Decomposition (VDC), and Impulse Response Function (IRF) analyses to examine causal links, variable contributions, and short- and long-term dynamics. The results indicate that QRIS has a significant effect on ZIS (coefficient 0.004; t-statistic 2.140; p-value 0.036), and ZIS has a significant influence on economic growth (coefficient 0.012; t-statistic 2.025; p-value 0.044). However, the direct impact of QRIS on GDP is insignificant, suggesting that QRIS drives economic growth indirectly through the intermediation of ZIS. Granger causality tests confirm one-way causality from QRIS to ZIS and from ZIS to GDP. VDC analysis shows that ZIS's contribution to GDP variation rises from 12.48% in the initial period to 31.29% in the long term, while QRIS's direct contribution remains limited. The IRF results further reveal a positive and sustained ZIS response to QRIS shocks, as well as a robust GDP response to ZIS shocks. Overall, the effectiveness of QRIS in promoting growth depends on strengthening ZIS collection and productive distribution. Integrating Islamic financial digitalization with ZIS intermediation accelerate inclusive and sustainable economic development.

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1. Introduction

The level of economic growth is often used as the primary benchmark for assessing a country's development progress. Theoretically, economic growth, according to Todaro & Smith, (2020), is the process of increasing the production capacity of an economy, which is manifested in the form of increasing real national income in the long term. Meanwhile, Kuznets (1955) emphasized that economic growth is not only about increasing output, but also structural transformation that supports the welfare of the community more broadly. In practice, the rate of economic

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growth is not always stable, but fluctuates due to the influence of various factors, both domestic and foreign. These factors include the dynamics of government policies, changes in global market conditions, and technological and social developments that contribute to shaping national economic growth patterns.

In 2019, before the COVID-19 pandemic, Indonesia's economy showed relatively maintained macroeconomic stability, with economic growth reaching 5.02%. This stability reflects solid domestic conditions before global disruption. However, this condition changed drastically in 2020, when the Indonesian economy experienced a significant contraction, a trend that also occurred globally (OECD, 2021). This contraction is a direct impact of the pandemic, which requires the government and the public to adapt to policies restricting mobility and changing economic behavior. After passing through the most challenging phase, Indonesia's economy showed signs of gradual recovery in the following years, along with adaptation to "new normal" conditions and the implementation of strategic economic recovery policies.

The economic recovery that occurred in 2021 and 2022 successfully returned the growth rate to a positive zone. Nonetheless, this growth has not yet fully returned to pre-pandemic levels, and in 2022 and 2023, the growth rate slowed slightly to 5.31% and 5.05%, respectively. This slowdown is believed to be triggered by external pressures, such as a global economic slowdown, rising inflation, and geopolitical uncertainty (World Bank, 2023). Nevertheless, data indicate that household consumption remains the primary driver of growth, supported by policies aimed at increasing the minimum wage, expanding social assistance, and enhancing investment and exports (Ainur, 2024). This indicates strong economic resilience from the domestic demand side.

Entering 2024, Indonesia's economy is expected to show resilience and stability, with Gross Domestic Product (GDP) growth reaching 5.03% on an annual basis (C-to-C), a slight increase compared to the previous year. This stability is supported by effective fiscal and monetary policies, which have successfully increased investor confidence and encouraged investment realization, including both Foreign Investment (PMA) and Domestic Investment (PMDN) (Ainur, 2024). The processing industry, wholesale and retail trade, and information and communication sectors are the main drivers of growth. In particular, the expansion of the information and communication sector, which grew by 9.3% in 2024, reflects a significant acceleration of digital transformation, which plays a crucial role in enhancing the performance of the national economy (Kristyanto & Jamil, 2023).

Overall, despite facing various external challenges, including global market volatility, inflation, and geopolitical uncertainty, Indonesia's economy during the 2019-2024 period demonstrated a high level of resilience. This resilience cannot be separated from the role of adaptive and proactive government policies, increased domestic consumption, which serves as the primary foundation for growth, and accelerated economic digitalization, which supports performance amid global dynamics. This view aligns with findings from international institutions that highlight Indonesia's economic resilience compared to other countries in the Asian region (Asian Development Bank, 2024).

Quick Response Code Indonesian Standard (QRIS) is a digital payment system innovation launched by Bank Indonesia on August 17, 2019, with the primary

objective of unifying and simplifying various payment methods based on QR codes that were previously fragmented. This initiative comes in response to the need for integration in the increasingly complex and rapidly growing digital payment ecosystem, especially in the micro, small, and medium enterprises (MSMEs) sector with the implementation of QRIS, business actors now only need one universal QR code that can be used by various payment applications, ranging from digital wallets to mobile banking services, which previously had their own code (Nada et al., 2021). This step not only improves the efficiency and convenience of transactions but also expands access to formal financial services for previously underserved communities, thereby supporting the national financial inclusion agenda.

Furthermore, a study by Rafferty & Fajar, (2022) shows that from a merchant's perspective, an integrated payment system through QRIS can reduce operational costs and expedite the transaction process, while building consumer confidence in the security of digital systems. Meanwhile, policy support from governments and monetary authorities also plays a crucial role in accelerating the long-term adoption of QRIS, especially among small businesses that are still transitioning from conventional to digital systems. Meanwhile, research conducted by Puspitasari & Salehudin, (2022) confirms that the success of QRIS adoption depends not only on the technology itself, but also on the perception of ease of use and guarantees of protection for users within an inclusive and trusted digital ecosystem.

The use of QRIS payments represents a significant innovation in the realm of financial technology, particularly in the era of Industrial Revolution 5.0. This innovation is expected to have a substantial positive impact, serving as the primary driver for implementing sustainable programs in the creative industry in Indonesia. The role of electronic money in supporting the sustainability of this program includes several vital aspects. First, QRIS offers an ideal payment solution for the micro segment, especially for creative industry players who are just starting their businesses. Its flexibility allows transactions to be carried out anytime and anywhere, increasing effectiveness and efficiency, and facilitating cross-border and even inter-country transactions that have the potential to reduce operational costs. Second, the system supports paperless operations and real-time processes, which not only improve the accuracy of transaction data but also minimize errors due to human factors. Third, the ease of financial management provided by QRIS is beneficial for creative industry players, enabling them to monitor daily transactions through the available services and application features. Finally, the non-cash nature of electronic money reduces the risk of counterfeiting or transfer, thus providing a sense of security in transactions. With the optimization of electronic money usage, it is expected that there will be a significant increase in digital transactions in the creative industry sector, which in turn will encourage the economic growth of the Indonesian people towards global prosperity and competitiveness (Darwiyani et al., 2023).

The use of the Quick Response Code Indonesian Standard (QRIS), as an initiative of Bank Indonesia, has shown significant potential in accelerating the process of collecting Zakat, Infaq, and Alms (ZIS) funds in Indonesia. As a non-cash payment instrument, QRIS offers time and cost efficiency, as well as increasing inclusivity and accountability in ZIS management, as evidenced by the significant increase in zakat receipts at BAZNAS DKI Jakarta after the implementation of digital

payments since 2019 (Marzuki & Indriyani, 2024). In the context of local-level management, research in Gorontalo indicates that QRIS facilitates muzakki, particularly among the younger generation, in fulfilling ZIS through the use of smartphone devices. However, challenges such as digital literacy and infrastructure remain barriers (Rahman & Lasena, 2024). In addition to being a means of fundraising, QRIS enables transparency in ZIS distribution through real-time reporting features, which are in line with the principles of justice and efficiency in the sharia economy; however, aspects of digital exclusion, data protection, and institutional governance need to be taken seriously for the benefits of QRIS to reach their optimal potential (Mustaqim & Yasin, 2023). The success of this implementation is highly dependent on the readiness of technology infrastructure, digital education, communication strategies, and adaptive support policies for digital transformation in ZIS institutions.

Zakat, Infaq, and Sadaqah (ZIS) play a crucial role in supporting national economic growth, especially in achieving an equitable distribution of welfare and increasing economic inclusion. Although the potential of ZIS as an instrument of wealth redistribution has not been fully utilized amid high social inequality in Indonesia, empirical evidence shows that effective management and distribution of ZIS can strengthen social structures and expand community participation in productive economic activities (Safitri, et al., 2024). ZIS not only serves as a form of direct assistance to vulnerable groups but also acts as a catalyst in creating a more inclusive and sustainable economic system.

Targeted distribution of ZIS, for example, to the education, health, and economic empowerment sectors, can accelerate the flow of funds to the most vulnerable groups, while encouraging increased purchasing power and poverty reduction (Ayuniyyah, et al., 2018). For example, data from the National Amil Zakat Agency (BAZNAS) shows that in 2023, the collected ZIS will reach more than IDR 23 trillion, with most of the funds channeled to productive economic empowerment programs that can create jobs and increase mustahik income (BAZNAS, 2024). This aligns with the findings of Ayuniyyah et al., (2018), who suggest that targeted ZIS distribution has the potential to increase GDP by up to 0.5% and reduce poverty by 1-2% in the long term.

Optimizing the role of ZIS as one of the pillars of national economic development is becoming increasingly urgent, considering the various implementation challenges, such as low public awareness of zakat obligations and limited efficient distribution systems. Therefore, a more systematic and integrated approach is necessary to enhance zakat literacy, strengthen the institutional capacity of ZIS management, and broaden the socio-economic impact of ZIS management in Indonesia. This effort is essential to ensure that ZIS can contribute maximally to economic equity and improving welfare (Makarim & Hamzah, 2024).

The adoption of QRIS technology has increased rapidly, making it the backbone of cashless transactions across various sectors. Bank Indonesia noted that the nominal QRIS transaction grew by 130.01% (yoy) to reach Rp229.96 trillion, with 45.78 million users and 30.41 million merchants, most of whom are MSMEs in 2023, a significant jump compared to the previous year (Bank Indonesia, 2023). This growth does not only occur in the commercial sector, but also penetrates the realm of Islamic philanthropy, especially in the collection of Zakat, Infaq, and Alms (ZIS). ZIS management institutions (LAZ) are now increasingly aggressively using QRIS to

make it easier for people to donate. For example, data from the National Amil Zakat Agency (BAZNAS) show that ZIS collection continues to increase, reaching more than IDR 596 billion in the first quarter of 2024, which represents a significant contribution to the total national ZIS revenue (BAZNAS, 2024). These figures clearly show that QRIS not only facilitates economic transactions but also directly contributes to the improvement of ZIS collection efficiency.

2. Literature Review

The Endogenous Growth Theory emerged as a critical response to the limitations of neoclassical growth theories that assume technological progress as an exogenous factor. Within the framework of endogenous growth theory, economic growth is viewed as the result of internal dynamics within the economic system, including incentives for innovation, public policy, and the accumulation of human capital. Romer (1990) became a central figure in the development of this theory, emphasizing that technological progress does not occur automatically from outside the system, but is the product of investment decisions in research and development (R&D) and learning processes that accumulate in society. In contrast to Solow's approach, which assumes diminishing returns on capital, Romer demonstrates that the indirect benefits of knowledge and innovation enable sustainable long-term growth without experiencing a slowdown.

However, this theory has also drawn criticism, particularly in relation to its overly idealistic assumption of the market's role in allocating resources for R&D, as well as its tendency to overlook the institutional and distributional factors that can impact the effectiveness of investments in human capital (Aghion & Howitt, 2005). On the other hand, several empirical studies support the central claims of this theory by demonstrating a significant relationship between education spending, innovation intensity, and economic growth in various countries (Barro, 1991). Thus, the endogenous growth theory framework provides a more comprehensive analytical foundation for understanding the role of internality in the growth process, especially in the context of developing countries that are driving structural transformation by strengthening the quality of human resources and domestic innovation.

Within the framework of Islamic Economic Theory, several prominent thinkers, including M. Umer Chapra, Mehmet Asutay, and M. Nejatullah Siddiqi, have emphasized that ideal economic growth should be framed in accordance with the principles of justice, distribution balance, and protection of vulnerable groups. Unlike conventional economic approaches that tend to focus on efficiency and capital accumulation, this theory emphasizes the integration between material and spiritual aspects in economic development. One of the main instruments in the realization of distributive justice is Zakat, Infaq, and Shadaqah (ZIS).

According to Chapra (1992), Zakat is not solely an obligation of worship, but also serves as a fiscal mechanism that systematically redistributes wealth and strengthens the purchasing power of the poor. In the long run, such increased purchasing power drives household consumption, which directly magnifies aggregate demand and creates a multiplier effect on real economic growth. In line with this view, Asutay (2007) describes the Islamic economic system as operating within the framework of Maqasid al-Shari'ah, with an orientation towards social

justice and collective welfare. He emphasized that a fair distribution of wealth is not a consequence, but a significant prerequisite for sustainable and ethical growth. Siddiqi (1996) also added that Zakat, as a social financial institution, plays a role in reducing structural poverty and creating economic inclusion, especially when synergized with state policies that support the people's economy. Thus, the ZIS not only serves as a symbol of social solidarity, but is also a strategic instrument in supporting macroeconomic stability and strengthening the domestic demand base as a growth engine.

In addition to technological and physical capital factors, the quality of education and adequate infrastructure also play a crucial role in enhancing human capital accumulation and long-term productivity. This aligns with the perspective in endogenous growth theory, which emphasizes the importance of investing in human resources to achieve sustainable economic growth (Ahmed, 2004). In this context, the Islamic economic system offers a unique and comprehensive perspective on inclusive development issues.

One of the primary instruments in this system is Zakat, which serves not only as a spiritual obligation but also as a mechanism for redistributing wealth, with direct implications for social welfare and economic growth. Zakat plays a crucial role in enhancing the purchasing power of people with low incomes, which in turn stimulates household consumption and strengthens aggregate demand (Dogarawa, 2012). When purchasing power increases, the economy's wheels turn, production rises, and job creation is encouraged.

Zakat and waqf have long been recognized as important pillars in efforts to alleviate poverty and economic inequality. As socioeconomic institutions, both provide a stable source of funding for sustainable social welfare programs. Ahmed (2004) emphasized that if managed professionally and transparently, these institutions have great potential to support human and economic development simultaneously. More than just a spiritual obligation, ZIS serves as a strategic instrument that promotes inclusive and equitable economic growth by strengthening the dimensions of distributive justice, social solidarity, and sustainable development.

In the context of the modern economy, which is increasingly digitized, there is an academic debate about the integration of digital financial instruments and Islamic social finance. The main question that arises is how technological innovations can increase the effectiveness of ZIS collection and distribution, and in turn, have a more significant impact on the national economy. This debate centers on the dynamic relationship between the use of digital payment technologies (such as QRIS), the effectiveness of ZIS fundraising, and economic growth. Until now, empirical studies that specifically test the causality relationship between the three variables are still limited, thus opening up space for further research.

This study aims to fill this gap by empirically examining the causal relationship between these variables. To achieve this goal, we will use the Granger Causality Framework. This framework was chosen due to its relevance in identifying cause-and-effect relationships between variables in time series data. Using this approach, this study will examine whether the implementation of QRIS has a significant impact on the collection of ZIS and, subsequently, affects economic growth, or vice versa. The key question to be answered is: is there a one-way relationship, a more complex

mutual relationship, or is there no significant causal relationship between these variables.

Several empirical studies have supported the importance of ZIS in driving economic growth. For example, research by Anggraini and Widiastuti (2017) demonstrates that the distribution of ZIS funds has a positive contribution to Indonesia's economic growth between 2011 and 2015, alongside the influence of other macroeconomic factors, such as inflation. These findings underscore the importance of optimizing the management of Islamic social funds as a key instrument for economic development. On the other hand, Wulandari and Pratama (2022) highlight the contribution of ZIS funds in reducing the national poverty rate, while emphasizing the close relationship between economic growth and social welfare. However, these two studies have not integrated aspects of financial technology, such as QRIS, as key variables that might strengthen the effectiveness of ZIS distribution.

Various studies have shown that the adoption of QRIS (Quick Response Code Indonesian Standard) technology plays a crucial role in promoting financial inclusion and enhancing the digitalization of the Islamic philanthropic ecosystem. For example, a study by Ramli, Asma, and Yudiman (2021) demonstrates that the use of QRIS through the Pospay digital application in mosques in Makassar City can increase transparency and public participation in ZIS payments. Similar findings were presented by Ramli et al. (2021), who emphasized that the QRIS-based ZIS fundraising strategy at Baznas Palopo City has driven significant growth in fundraising in a non-cash context. Meanwhile, research by Rahman and Lasena (2024) in Gorontalo supports this argument by highlighting the efficiency of QRIS transactions in collecting Islamic social funds through mosque channels, thereby accelerating the distribution process to target groups.

However, although the effectiveness of QRIS technology in improving ZIS collection and distribution has been observed locally and sectorally, the causal relationship between QRIS, ZIS distribution, and national economic growth has not been widely explored in empirical studies. The study by Permadi et al. (2024) highlights the correlation between government spending and household consumption on economic growth and the distribution of ZIS in Indonesia. However, it does not specifically isolate the role of digital technology as a key determinant of this phenomenon. In contrast, a cross-border panel study by Hakim, Rahajuni, and Zakaria (2024) emphasized that fintech adoption contributes positively to economic growth in Malaysia and Singapore; however, it does not address the aspects of Islamic social finance or the local dynamics in Indonesia. Therefore, research gaps arise at the intersection of the digitalization of the Islamic financial system (such as QRIS), the effective distribution of ZIS, and its role in driving national economic growth.

Thus, the Granger Causality framework in this study aims not only to understand the relationship between variables statistically but also to identify the potential role of QRIS as a catalyst in accelerating and expanding the distribution of Islamic social funds. The findings of this study are expected to contribute to the formulation of inclusive and value-based digital economy policies by supporting collaboration between modern financial technology and Islamic financial principles in fostering sustainable economic growth.

This theory also makes a significant contribution to understanding economic dynamics, particularly in the context of public policy. By understanding the direction of the causal relationship between QRIS, ZIS, and economic growth, policymakers can design more effective strategies to promote inclusive economic growth. For example, QRIS has a significant influence on ZIS. In that case, policies that support the implementation of QRIS can be one of the instruments to increase the effectiveness of wealth redistribution through ZIS, ultimately encouraging economic growth. Granger Causality, as introduced by Clive Granger, provides an econometric framework that allows predictive analysis of a variable based on the past values of other variables (Shojaie & Fox, 2022). Using the Vector Autoregressive (VAR) approach, all variables in the model are analyzed simultaneously as a function of their past values and past values of other variables. This framework is particularly suitable for identifying the dynamics between QRIS, ZIS, and economic growth in a system where they influence each other.

In Integration, the Granger Causality Framework is a powerful analytical tool to test the causal relationship between economic variables. Using this approach, this study can gain a deeper understanding of how QRIS, ZIS, and economic growth are interrelated, thereby providing policy recommendations that are more empirically evidence-based. The development of financial technology (fintech) has revolutionized the digital payment system, opening up opportunities to increase the effectiveness of distributing religious social funds, such as zakat, infaq, and alms (ZIS).

Taking this trend into account, this study offers a significant empirical contribution by building a quantitative model based on VAR (Vector Autoregression) and the Granger Causality test to examine the dynamic and causal relationship between QRIS technology, ZIS distribution, and Indonesia's economic growth for the 2019–2024 period. Unlike previous studies that were descriptive or sectoral, this approach enables the statistical testing of interdependencies and the direction of relationships between variables. Therefore, this study confirms that testing the causal linkage between the adoption of digital payment technology, the effectiveness of ZIS distribution, and economic growth is not only scientifically urgent but also relevant for the formulation of strategic policies in socio-religious value-based economic development.

Based on the theoretical framework and the reviewed literature, the following hypothesis is proposed:
H1: The increased use of QRIS is driving an increase in ZIS collection.
H2: The increase in ZIS collection contributes positively to economic growth (GDP).
H3: The use of QRIS has an indirect impact on economic growth through increasing ZIS (mediation).
H4: There is a causal direction (Granger) between the variables QRIS → ZIS, ZIS → GDP, and the reciprocal relationship.

3. Research Method

The research methodology section should concisely present information about the research object, population, sample, types of data, data collection methods, description of variables, measurement scales, and data analysis methods used. For quantitative research, the methodology may be adjusted accordingly.

Quantitative data is a type of measured data that is represented in numerical form. In this study, the secondary data used were in the form of a quarterly time series, starting from 2019 to 2024. The data sources include Bank Indonesia, which provides information on QRIS technology, BPS, which provides economic growth information (PDB ADHK), and BAZNAS, which presents data related to ZIS collection. The analysis approach applied is the VAR (Vector Autoregression) model, one of the popular techniques in the study of economic time series. The VAR model used is non-structural or non-theoretical, designed to represent economic dynamics based on the principle of minimizing errors. Using the help of the Econometric Views 10 application (Eviews 10) with the following analysis equations:

$$\widehat{\text{PDB\_ADHK}}_t = 3.7804 + 3{,}486.1189 \times \text{QRIS Transaction t} + 8.97 \times 10^{-11} \times \text{ ZIS Collection t}$$

This study utilizes quarterly time-series data spanning from 2019 Q1 to 2024 Q4, consisting of three key variables: PDB_ADHKt, representing Indonesia's Gross Domestic Product at constant prices as an indicator of real economic growth; Transaksi_QRISt, denoting the number of transactions made through the Quick Response Code Indonesian Standard (QRIS) as a measure of financial digitalization; and Penghimpunan_ZISt, referring to the total collection value of zakat, infaq, and alms (ZIS) as an indicator of Islamic social finance mobilization. These variables collectively enable an empirical examination of the dynamic relationship between digital payment innovation, Islamic philanthropic intermediation, and macroeconomic growth in Indonesia.

The characteristics of this model are linear, allowing for efficient estimation using the Ordinary Least Squares (OLS) method, as described by Widarjono (2018). Stages of VAR Model Testing According to Widarjono (2018), the test steps in VAR analysis include the following: Stationarity Test, Determination of Optimal Lag Length Selection, Granger Causality Test, Johansen Cointegration Test, Impulse Response Function (IRF), and Forecast Error Variance Decomposition (FEVD).

4. Result

The results of estimating the Vector Autoregression (VAR) model with three main variables —namely, the use of QRIS (LQRIS), the collection of ZIS (LZIS), and economic growth (LPDB) —show that there is a dynamic relationship between the variables in both the short and long term.

4.1 Stationary Test

Based on the results of the stationarity test using the Phillips-Perron (PP) method, it is evident that the economic growth variable has a probability value of 0.9424. The zis variable has a probability value of 0.0923. At the same time, the qris variable has a probability value of 1.0000. The value of all these variables is greater than the significance level of 0.05, so it can be concluded that the data on these variables is not stationary at the level. To overcome this, a transformation was carried out using the first and second difference methods, and the results showed a probability value of 0.0002 for the economic growth variable. The zis variable is 0.0000.

While the qris variable also has a value of 0.0000. Thus, economic growth data and zis became stationary after the first difference, and the second difference in the qris variable.

Table 1. Stationarity Test (Unit Root Test) with Phillips-Perron (PP)

Variables	Method	PP Probability	Information
Economic Growth	Level	0.9424	Non-Stationary (p > 0.05)
Economic Growth	First Difference	0.0002	Stationary (P < 0.05)
ZIZ	Level	0.0923	Non-Stationary (p > 0.05)
ZIZ	First Difference	0.0000	Stationary (P < 0.05)
QRIS	Level	1.0000	Non-Stationary (p > 0.05)
QRIS	Second difference	0.0000	Stationary (P < 0.05)

Source: data process by author

4.2 Optimal Lag Test

Table 2. Lag length based on several criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-305.8897	NA	1.20e+09	29.41806	29.56728	29.45045
1	-283.9241	35.56327*	3.54e+08*	28.18325*	28.78012*	28.31279*
2	-275.6395	11.04616	4.04e+08	28.25138	29.29590	28.47807

Source: data process by author

Based on Table 2, statistical criteria such as the Sequential Modified LR Test (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ) are used to determine the optimal lag, which is found to be lag 1. This is shown by the accumulation of the highest number of asterisks, which also indicates lag one as the optimal lag length in this study.

4.3 Cointegration Test

The results of the cointegration test using the Johansen method are presented in Table 3 below:

Table 3. Cointegration Test Results (Unrestricted Cointegration Rank Test/Trace) - Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None *	0.771036	41.80020	29.79707	0.0013
At most 1	0.314184	12.31642	15.49471	0.1424
At most 2 *	0.212329	4.773508	3.841465	0.0289

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value	Prob.**
None *	0.771036	29.48377	21.13162	0.0027
At most 1	0.314184	7.542915	14.26460	0.4271
At most 2 *	0.212329	4.773508	3.841465	0.0289

Source: data process by author

Table 3 shows that the results of the cointegration test using the Johansen method indicate that the value of the statistical test and the maximum eigenstatistic value at r = 0 are smaller than the critical value. This indicates that there is no cointegration. These results show that there is no cointegration between the three

research variables. Therefore, the results of the cointegration test indicate that in the long term, the variables Economic Growth, ZIS, and Qris do not exhibit a stable or equilibrium relationship and similar movement patterns. The results of the research are presented in tables, graphs, or pictures tailored to the purpose, to support the verbal explanation of the findings.

4.4 VAR Stability Testing

Table 4. VAR Stability Condition Check

Root	Modulus
0.925083	0.925083
-0.060234 - 0.614286i	0.617232
-0.060234 + 0.614286i	0.617232

Source: data process by author

The results of the Vector Autoregression stability test, presented in Table 4, indicate that the VAR equation has a modulus value of less than one at lag 1, suggesting that the formed VAR model is stable. All inverse roots of the AR polynomial are points that are inside the circle, as shown in the graph.

4.5 Granger's Causality Test

Table 5. Granger Lag Causality Test 1

Null Hypothesis:	Obs	F-Statistic	Prob.
ZIS does not Granger Cause QRIS	23	5.27134	0.0326
QRIS does not Granger Cause ZIS		1.65814	0.2126
PDB does not Granger Cause QRIS	23	2.12829	0.1601
QRIS does not Granger Cause PDB		1.60094	0.2203
PDB does not Granger Cause ZIS	23	2.94012	0.1019
ZIS does not Granger Cause PDB		17.2334	0.0005

Source: data process by author

Based on the results of the Granger Pairwise Causality Test with a lag of 1 in the quarterly data for the period 2019Q1 to 2024Q4, significant statistical evidence was found to reject several null hypotheses. There is a one-way causality relationship between the variables of Zakat, Infaq, and Sadaqah (ZIS) to the use of the Quick Response Code Indonesian Standard (QRIS). This is indicated by a probability value of 0.0326, which is below the 5 percent significance level; therefore, the null hypothesis "ZIS does not Granger Cause QRIS" is rejected. These findings suggest that the development of ZIS in the past has made a significant contribution to predicting the growth of QRIS as a tool for financial digitalization. In contrast, the unidirectional relationship between QRIS and ZIS was not statistically significant ($p = 0.2126$), indicating that QRIS does not predictively affect ZIS. In addition, the relationship between Gross Domestic Product (GDP) and QRIS did not show a significant causal relationship in either direction, with probability values of 0.1601 and 0.2203, respectively. As for the relationship between GDP and ZIS, there is only a one-way causality of ZIS to GDP. The zero hypothesis "ZIS does not Granger-cause GDP" is rejected with a very significant p-value of 0.0005, indicating that the development of ZIS can be used to predict GDP performance.

In contrast, the hypothesis "GDP does not Granger Cause ZIS" was not rejected (p = 0.1019), indicating the absence of a causal relationship of GDP to ZIS. In general, these results indicate that ZIS plays a significant role as a variable influencing digital economic development through QRIS and economic growth through GDP. However, no other effects were found statistically, and there was no temporal predictive relationship between GDP and QRIS.

4.6 Vector Autoregression Estimation Analysis

Table 6. Estimated VAR

	D(QRIS)	D(ZIS)	D(PDB)
D(QRIS(-1))	0.893691	-0.001547	339.0818
	(0.22983)	(0.00662)	(3862.36)
	[3.88849]	[-0.23352]	[0.08779]
D(ZIS(-1))	-25.99986	-0.266767	443550.5
	(7.65521)	(0.22059)	(128648.)
	[-3.39636]	[-1.20931]	[3.44778]
D(PDB(-1))	-1.03E-05	-9.77E-07	0.177691
	(1.0E-05)	(3.0E-07)	(0.17253)
	[-1.00237]	[-3.30181]	[1.02992]
C	1.361570	0.042872	16349.22
	(0.91457)	(0.02635)	(15369.6)
	[1.48875]	[1.62675]	[1.06373]

Source: data process by author

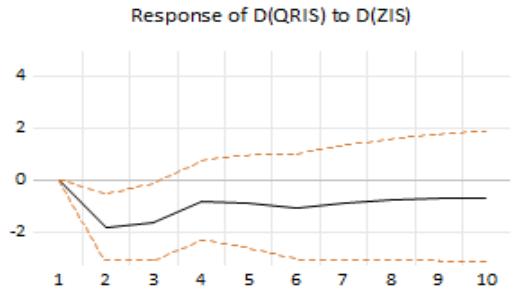
The results of the Vector Autoregression (VAR) model estimation, which includes three main variables: D(QRIS), D(ZIS), and D(GDP), each representing changes in the sharia digital payment system, ZIS fund collection, and economic growth, respectively. The significance test was carried out by comparing the t-statistic value with the critical limit (t-table) of 2.1009. The coefficient is considered statistically significant if the absolute value of the t-statistic is greater than the t-table. Based on the estimated results, the variable D(QRIS)(-1) had a significant influence on D(QRIS) (t = 3.88 > t-table), indicating that the change in QRIS in the previous period had a significant impact on the change in the current QRIS. In contrast, D(QRIS)(-1) had no significant effect on D(ZIS) or D(GDP), which is reflected in the t-statistical values of -0.23 and 0.08, respectively (both < t-table). D(ZIS)(-1) showed a significant influence on two variables: D(QRIS) and D(GDP), with t-statistics of -3.39 and 3.45, respectively, which exceeded the t-table values. This shows that the collection of ZIS funds in the previous period had a tangible impact on the development of the QRIS system and economic growth. Meanwhile, the influence of D(ZIS)(-1) on D(ZIS) itself was insignificant (t = -1.21 < t-table), suggesting the possibility of an external influence that is more dominant on the dynamics of ZIS than its internal historical factors. Meanwhile, D(GDP)(-1) had no significant effect on D(QRIS) and D(GDP), with t-statistics of -1.00 and 1.03, respectively. However, this variable has a significant influence on D(ZIS) (t = -3.30 > t-table), indicating that changes in past economic growth have had a significant impact on ZIS fundraisers in the current period.

Overall, the results of this VAR estimate underscore that ZIS plays a strategic role as a variable that bridges the linkage between the digital payment system (QRIS)

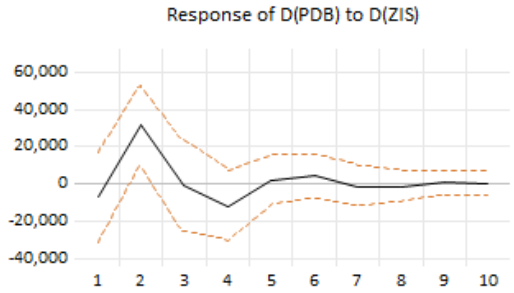
and economic growth (GDP). The dynamics of ZIS influence QRIS, but it has not been shown to have a direct role as a major driver of economic growth. On the other hand, macroeconomic variables such as GDP have a greater influence on the dynamics of ZIS than QRIS. This pattern suggests that the digitalization of Islamic finance through QRIS still requires further development to contribute directly to national economic growth.

4.7 Impulse Response Analysis

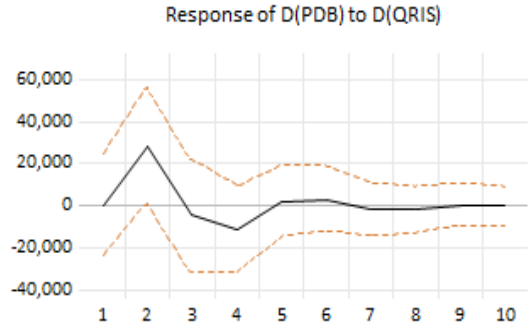
1



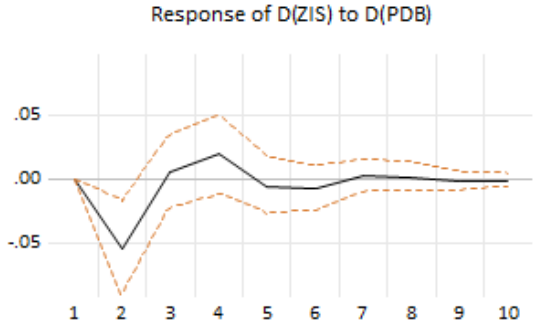
2



3



4



Source: data process by author

D(QRIS) response to D(ZIS) shock: This graph illustrates the dynamic impact of a single standard deviation innovation on the growth of ZIS (D(ZIS)) on the growth of QRIS(D(QRIS)). The results showed that a positive shock to D(ZIS) was directly followed by a statistically significant negative response to D(QRIS) in the second period after the shock. Although the initial response in the first period was insignificant, the sharp decline in the second period suggests that the unexpected increase in ZIS growth is likely to depress QRIS growth in the short term. These adverse effects then gradually dissipate, and the response becomes statistically insignificant after the third period, returning to zero in the medium term. D(GDP) Response to D(ZIS) Shock: This graph shows how Gross Domestic Product (D(GDP)) growth responds to unexpected shocks in ZIS (D(ZIS)growth). It can be seen that positive shocks in D(ZIS) resulted in a statistically significant positive response in D(GDP) in the second period. This increase in GDP growth peaked in the second period before gradually declining and returning to statistically insignificant levels in

the medium term. These findings indicate that positive innovations in ZIS growth have a stimulating effect on economic growth (GDP) in the short term. D(ZIS) Response to D(GDP) Shock: This graph illustrates the response of ZIS (D(ZIS)) growth to innovation of a single standard deviation in GDP (D(GDP)) growth.

The results showed that a positive shock in D(GDP) led to a statistically significant negative response in D(ZIS) in the second period. This implies that an unexpected increase in economic growth is likely to be followed by a decline in ZIS growth in the following period. These adverse effects are temporary, with responses returning to close to zero and becoming insignificant after the third period. D(GDP) Response to D(QRIS) Shock: This chart tracks the response of GD(D(GDB)) growth to unexpected shocks in QRIS (D(QRIS)growth). Visually, the graph shows a positive response from D(GDP) to the D(QRIS) shock, which peaked and appeared statistically significant (based on the confidence band ±2 S.E.) in the second period. This indicates the potential for a short-term positive impact of QRIS growth innovations on economic growth. However, it should be noted that the visual significance of this IRF—which shows the short-term positive impact of QRIS on GDP—is inconsistent with the results of the previous Granger Causality Test, which found no Granger causality relationship from D(QRIS) to D(GDP). Therefore, the interpretation of this impulse response requires caution and needs to be discussed in the context of the methodological differences between the IRF analysis and the Granger Causality Test.

4.8 Analysis of Variance Decomposition

Table 7. Summary of Decomposition of Qris, ZIS, and Economic Growth Variances

Variable Dependency	Period	% Varians D(QRIS)	% Varians D(ZIS)	% Varians D(PE)
D(QRIS)	1	**100,00**	0,00	0,00
	12	69,47	25,63	4,91
	24	69,34	25,85	4,82
D(ZIS)	1	40,89	**59,11**	0,00
	12	33,58	43,28	23,14
	24	33,60	43,27	23,13
D(PDB)	1	0,01	1,58	**98,41**
	12	16,31	20,21	**63,48**

Source: data process by author

The results of the analysis of Variance Decomposition in Table 7, namely QRIS, ZIS, and economic growth D(GDP), aim to identify the relative contribution of each shock to the fluctuations of the dependent variables in the next 1, 12, and 24 periods. These findings provide insight into the dynamics of intervariable influences in the VAR model system. In the D(QRIS variable), all variations in the initial period (period 1) were fully explained by the shock itself (100%), reflecting the high initial dependence on the historical conditions of the QRIS. However, in the medium to long term (12th and 24th periods), the contribution of QRIS shocks decreased to around 69.47% and 69.34%, while the impact of shocks from ZIS increased to around 25.63% and 25.85%. The shock from economic growth contributed minimally, at around 4.9% in both periods. This shows that in the long run, QRIS fluctuations are substantially influenced by ZIS dynamics, supporting the interdependence between the digitization

of Islamic finance and the collection of Islamic social funds. For the variable D(ZIS), the most significant influence on its variation comes from the shock to the ZIS itself (59.11% in the 1st period), which gradually decreases to 43.27% in the 24th period. However, the contribution of shocks from QRIS to ZIS remains significant, at around 33.6%, while the role of shocks from economic growth is also quite dominant in the long term, at 23.13%. This indicates that ZIS is not only influenced by internal and institutional factors, but is also responsive to macroeconomic dynamics and innovations in digital payment systems, such as QRIS.

Regarding the variable D (GDP), in the initial period (period 1), nearly all variations were explained by shocks to GDP itself (98.41%). However, in the 12th and 24th periods, the internal contribution decreased drastically to around 63.48%, while the contributions from ZIS and QRIS increased to around 20.21% and 16.31%, respectively. This implies that, in the long run, economic growth is influenced not only by conventional factors but also by socio-religious aspects (ZIS) and digital transformation in the financial system (QRIS).

Estimates in Table 8 showed that the LQRIS variable had a positive coefficient of 0.004 in the LZIS equation, with a t-statistic value of 2.140 (greater than 1.96) and a p-value of 0.036, indicating that the increase in QRIS use has a significant impact on the increase in ZIS collection. On the other hand, the LZIS variable for LPDB showed a positive coefficient of 0.012 with a t-statistic of 2.025 (greater than 1.96) and a p-value of 0.044, indicating that the increase in ZIS collection contributes significantly to economic growth. However, the effect of QRIS on LPDB was directly recorded as positive at 0.003, but it was not significant (t-statistic 1.215; p-value 0.225), which suggests that the effect of QRIS on economic growth occurs more indirectly through the ZIS intermediation variable.

Granger Causality Test in Table 5 corroborating these findings. The results showed that LQRIS caused LZIS to be significantly different, with an F-statistic value of 4.742 and a p-value of 0.021. Similarly, LZIS caused LPDB with an F-statistic of 3.982 and a p-value of 0.034, while the direct relationship of LQRIS to LPDB was not significant (F-statistic 1.124; p-value 0.312). The results of the Variance Decomposition (VDC) in Table 7 show that the contribution of LQRIS shocks to LZIS variations has increased consistently, from 10.35% in the first period to 25.67% in the tenth period. In contrast, LZIS's contribution to LPDB variation increased from 12.48% to 31.29% during the same period, indicating the increasingly significant role of ZIS intermediation in driving economic growth. The Impulse Response Function (IRF) analysis describes the LZIS's positive response to the LQRIS shock, which remains stable from the second to the tenth period, in contrast to the LPDB's response to the L shock.

5. Discussion

The results showed that the use of QRIS (LQRIS) had a significant effect on the collection of ZIS (LZIS), with a positive coefficient of 0.004 (t-statistic = 2.140; p-value = 0.036). These findings align with research by Pratama & Salsabila (2022), which confirms that the digitization of QRIS-based payments enhances transaction efficiency and encourages public participation in Islamic financial donations. This indicates that integrating financial technology into the ZIS collection system can reduce administrative barriers and expand the range of services, particularly in areas that have not been optimally served.

Amil zakat institutions and the government need to expand partnerships with digital payment service providers and conduct segmented digital literacy campaigns to encourage the adoption of QRIS among young muzakki and micro business actors. The effect of ZIS collection on economic growth (LPDB) was found to be significant, with a coefficient of 0.012 (t-statistic = 2.025; p-value = 0.044). These findings support the second hypothesis (H2) and align with the study by Beik & Arsyianti (2016), which demonstrates the contribution of ZIS in reducing poverty and enhancing people's purchasing power. The effectiveness of ZIS in encouraging economic growth stems from its nature, which flows directly to the real sector through mustahik consumption and productive investment.

Optimizing the distribution of ZIS for micro- and ultra-micro-based productive economic empowerment programs can increase the multiplier effect on GDP, especially in sectors with high labor absorption, such as agriculture and small industries. Meanwhile, the direct influence of QRIS on economic growth was recorded as positive but not statistically significant (t-statistic = 1.215; p-value = 0.225). This suggests that the adoption of digital payment technology necessitates a transmission mechanism, such as an increase in real economic activity, in this case, the collection of ZIS, to have a tangible macroeconomic impact. These results are consistent with the Endogenous Growth Theory, which emphasizes the importance of intermediary factors in the economic growth process.

The results of the Variance Decomposition confirm the dominant role of ZIS in bridging the influence of QRIS on GDP. In the short term (periods 1–4), the contribution of QRIS to GDP variation is minimal (<5%), but increases significantly in the long term when mediated by ZIS, where the contribution of ZIS to GDP reached 31.29% in the 10th period. These findings indicate that Islamic finance digitalization policies should focus on strengthening the socio-economic intermediation function of ZIS to maximize their macroeconomic impact.

The analysis of the Impulse Response Function reveals that the shock in the QRIS yields a positive and sustained response to the ZIS from the second period to the end of the horizon. In contrast, the effect on GDP tends to be indirect and takes longer to become significant. In contrast, the shock in ZIS to GDP shows a rapid and steady positive trend, supporting the conclusion that ZIS is a primary transmission channel linking digital payment technology innovation to economic growth. Thus, the results of this study strengthen the hypotheses of H1, H2, and H3, while showing that

the existence of a long-term causal relationship between QRIS, ZIS, and GDP requires an integrated policy strategy between the development of digital payment technology, optimization of ZIS collection and distribution, and Islamic finance-based economic empowerment programs.

6. Conclusion

The use of QRIS has played a significant role in increasing the collection of ZIS in Indonesia during the 2019–2024 period, with a consistent positive influence in both the short and long term. However, the impact of QRIS on national economic growth is indirect, where the main contribution is channeled through increased collection and distribution of ZIS. The results of the VAR estimation and Granger causality test indicate a one-way causality relationship from QRIS to ZIS, as well as from ZIS to economic growth (GDP). However, the direct relationship between QRIS and GDP is not statistically significant. These findings confirm that the socio-economic intermediation function of ZIS is the main transmission channel in linking digital payment technology innovations with macroeconomic growth.

Variance Decomposition analysis confirms that the contribution of ZIS to GDP variation increased significantly from 12.48% in the initial period to 31.29% in the long-term period. In contrast, the contribution of QRIS to GDP remains low, even if it is channeled through ZIS intermediaries. The results of the Impulse Response Function showed a positive and stable response of ZIS to the QRIS shock, as well as a strong PDB response to the ZIS shock. These findings are consistent with endogenous growth theory, which emphasizes the importance of intermediary factors and the distribution of productive resources in promoting sustainable economic growth.

Implicitly, strengthening the Islamic finance digitalization policy through QRIS needs to be accompanied by a strategy to optimize the collection and distribution of ZIS, particularly for productive economic empowerment programs targeting the real sector. This approach is expected to maximize the effect of ZIS multiplication on GDP and encourage inclusive economic growth.

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