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Driving regional economy: Digital technology adoption's role for effective distribution of islamic social finance in Indonesia

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Abstract: Indonesia holds significant potential in leveraging the vast collection of Islamic social funds. Amid the widespread digital transformation within financial institutions, it is critical to examine the impact of the adoption of digital technology in affecting the distribution of Islamic social finance and its subsequent impact on regional economic development in Indonesia. The research utilized data from 21 provinces in Indonesia to construct a regression model that investigates and evaluates the performance of Islamic social fund distribution concerning regional economic growth. This study integrates a moderation effect model to assess the impact of digital adoption on this relationship. Grouped regression models were used to investigate further regional variations, with robustness checks conducted across different fundraising levels. The findings reveal a significant influence of Islamic social fund distribution on regional economic development, with digital adoption—measured by access to and use of digital technology—acting as a considerable moderator. Further heterogeneity analysis reveals that provinces with lower GINI coefficients experience a more pronounced dampening effect of Islamic social fund distribution on regional economic development, moderated by the extent of digital adoption. This research offers new insights into the relationships between Islamic social fund distribution and digital adoption (ICT) in regional economic development, providing strategic implications for philanthropic institutions and policymakers considering Islamic social fund management.

Keywords: Digital Adoption; Indonesia; Islamic Fund; Regional Economic Development; Social Finance

JEL Classification: O47; G21; O33; R58

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Introduction

Economic development refers to a systematic effort to increase the aggregate economic region of a country (Mankiw et al., 2012). It is a complex and multifaceted process involving systematic efforts and many factors that can influence a country's regional economy, such as population changes, increased human resources, investment, inflation, technological progress, and changes in consumption behavior (Todaro & Smith, 2020). Simon Kuznets defines *economic development* as a nation's capacity to consistently supply goods and services to its population over the long term. His definition includes three key elements: 1) Regional economy involves a continuous increase in the production of final goods and services;

2) Technological progress drives growth by enhancing human resources; and 3) The practical application of scientific and technological advancements requires appropriate institutions and ideologies to ensure that innovations are adopted efficiently and accurately (Haseeb et al., 2019; Mankiw, 2010).

Studies indicate that in developing countries, the primary macroeconomic factors influencing the regional economy are foreign aid, foreign direct investment, fiscal policy, investment, trade, human capital development, demographics, monetary policy, natural resources, reforms, as well as geographic, regional, political, and financial factors (Chirwa & Odhiambo, 2016). Similarly, in developed countries, the main macroeconomic factors linked to the regional economy are physical capital, fiscal policy, human capital, trade, demographics, monetary policy, and financial and technological aspects.

From an Islamic economic perspective, the accurate allocation and optimal utilization of Islamic social finance—such as zakat, infaq, alms, and other religious funds—can drive regional economic development by enhancing consumption and improving people's purchasing power to meet their needs (Herianingrum et al., 2024). Al-Faizin et al., (2017) stated that Islamic social funds contribute to achieving a balanced quality of life within Muslim communities.

According to the Indonesia Zakat Outlook 2024 (Figure 1), the national zakat collection from 2018 to 2023 exhibits a positive trend, with annual increases in zakat collection. In 2018, the national zakat collection amounted to IDR 8.12 trillion, rising to IDR 22.48 trillion in 2022 and reaching IDR 33.00 trillion in the first half of 2023. This upward trend in zakat collection reflects the improved performance of zakat institutions and heightened public awareness of fulfilling zakat obligations through official channels (BAZNAS, 2024).

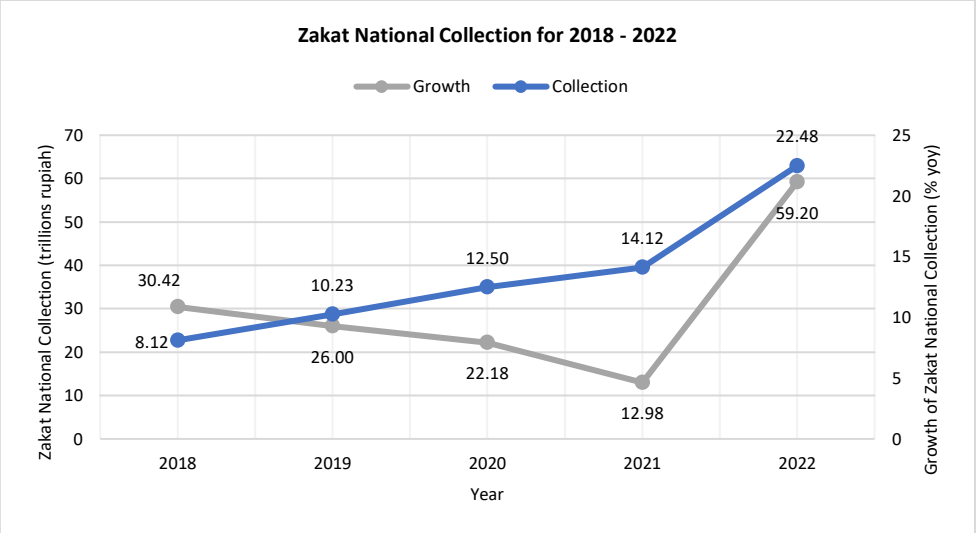

Figure 1 Zakat National Collection for 2018 - 2023 Semester I
Source: (BAZNAS, 2024)

Islamic Social Funds are one of the five essential pillars of Islam and part of Islamic finance. Islamic Social Funds represent the purity and cleanliness of Muslim wealth (Samad & Glenn, 2010). Muslims must pay Islamic Social Funds if they meet the conditions for Zakat (Owoyemi, 2020).

Zakat Management Institutions (LPZ) actively promote various Zakat campaigns, including collaborations with different digital platforms to carry out the spirit of Zakat. BAZNAS presents the Muzaki Corner platform to create attraction and convenience for Muzaki in the Zakat payment process (BAZNAS, 2024). So, through collaboration between LPZ, the great potential for collecting Zakat, Infaq, and Sedekah (ZIS) in Indonesia can be optimized. The impact of ZIS distribution is felt not only by the Indonesian people but also by the world, which is currently facing various challenges, especially in the economic and social aspects post-pandemic.

According to Bilo & Machado (2020); Saad & Farouk (2019); and Samad & Glenn, (2010), in Islamic economic theory, the primary goals of paying Islamic Social Funds include lowering poverty levels, ensuring fairness in social and economic systems, safeguarding wealth, addressing social issues, purifying Muslim wealth, resolving financial complexities, and reminding Muslims to be grateful to Allah. Zakat comes from various sources of wealth, including investment activities, bank savings, trade, and agricultural activities (Indrawan & Herman, 2017). According to Qur'an Surah At-Taubah: 60, recipients of Islamic Social Funds include the poor and needy, those who collect zakat, new converts to Islam, prisoners of war, Muslims in debt, individuals working in the way of Allah, and travelers.

Islamic social finance serves as a complementary mechanism, both a supporter and a catalyst to alleviate the government's burden in achieving economic equality and social welfare. With Islamic social finance, it can strengthen the state's responsibility in providing social protection through subsidies and social assistance, by making Islamic social finance a tool and solution for income redistribution schemes (Chapra, 2002). Islamic Social Finance provides great hope to be a solution in overcoming socio-economic problems, poverty (Choudhury & Harahap, 2008; Beik & Arsyianti, 2013), income inequality (Shaikh & Ismail, 2017), and various other socio-economic problems (Qudah et al., 2022). The impact of Islamic social and financial instruments is increasingly being recognized, not just in Muslim-majority countries but also in countries with Muslim minorities (ISDB, 2023), as one of the religious obligations in Islam. Islamic social funds have a range of effects, including alleviating poverty to achieve economic welfare, supporting efficient allocation and distribution of personal income, and contributing to inclusive national economic development (Saputro & Sidiq, 2020). Regional economies must prioritize per capita inclusiveness as a critical factor in their development strategies. The concept of inclusiveness shows the quality of the regional economy, where all levels of society enjoy the results of development equally (Adeleye, 2023). Therefore, special attention and treatment are needed for Islamic social funds considering the impact of major changes on society.

Several researchers have researched the role of Islamic social funds and regional economy, the impact of zakat distribution on directed increased consumption, investment, or government expenditure, and regional economy in Muslim countries, and found that regions with better zakat management systems experienced higher economic regional rates. Fajarudin (2019) strengthens that the Islamic social fund has great potential to support any economic program of the national government in Indonesia. Al-Faizin, Insani, & Widiastuti, (2017) and other researchers such as Qudah et al. (2022) and Sudrajat (2023) attempted empirically to test the nexus between zakat and economic development.

Al-Faizin et al., (2017) states that Islamic Social Fund payments are obligatory to ensure a redistribution system between Muslim wealth holders and recipients. Additionally, these funds contribute to achieving balance in the lives of Muslims. Zakat comes from various sources of wealth, including investment activities, bank savings, trade, and agriculture (Indrawan & Herman, 2017). According to Qur'an Surah At-Taubah: 60, recipients of Islamic Social Funds include the poor and needy, those who collect zakat, new Muslims, captives, Muslim debtors, individuals working in the cause of Allah, and travelers.

This research focuses on integrating Islamic Social Fund distribution, digital adoption, and regional economic growth. So, the empirical research related to the Islamic Social Fund, ICT, and economic growth concluded by several current researchers, such as Behera et al., (2024); Gheraia et al., (2022); Khasandy et al., (2019) have reported and discussed particular exclusively Islamic business finances and the subject will continue to be of interest. From the author's knowledge, there has not been much literature elaborating on the integrated distribution of the Islamic social fund, its technological cracks usage, and the geographic regional organic economic elements through the lens of the model interactions of empirical research. So, this research aims to address the gap by empirically examining the interaction between Islamic social fund distribution, digital adoption (ICT), and regional economy. It seeks to determine if there is a significant relationship among these variables, using comprehensive proxies for Islamic social fund distribution from government and philanthropic institutions. The primary goal is to understand how to optimize the relationship between ISF distribution, digital adoption, and economic growth, with a particular focus on how ICT can enhance the distribution of ISFs and contribute to economic development in Indonesia. This research contributes to empirical and theoretical development. Building a model has been explored in different ways but never in a way that gathers all the components, including Islamic social fund distribution, ICT, and economic development.

This research examines provinces in Indonesia using panel regression analysis with data from 21 provinces spanning 2013 to 2022. It explores the interaction between Islamic social fund distribution and regional economic growth. It assesses the effect of digital technology access and usage in Indonesia, employing the ICT development index proxy. The paper is clearly organized. In the first section, the research topic is introduced. The second section engages with the existing literature and formulates the hypotheses. The research methods, data, and design are detailed in the third section. The fourth section

presents the empirical analysis, followed by a discussion. Finally, the fifth section concludes by examining the implications of the findings.

Research Method

Data Collection and Variable Description

This research uses quantitative methods to develop an integrated Islamic social finance refer to Baltagi, (2005) and utilizes secondary data, analyzing critical indicators from 21 provincial administrative units in Indonesia from 2013 to 2022, totaling 210 data sets. The dataset comprises 21 provinces, strategically chosen as a representative sample to ensure balanced representation across major islands, including Sumatra, Java, Kalimantan, Sulawesi, and Papua. These provinces include West Sumatra, Riau, South Sumatra, Bangka Belitung, Jakarta (DKI Jakarta), West Java, Central Java, Yogyakarta (DIY), East Java, Banten, Bali, Central Kalimantan, South Kalimantan, East Kalimantan, North Kalimantan, North Sulawesi, Gorontalo, North Maluku, Aceh, West Nusa Tenggara (NTB), and West Papua. This approach ensures that the research covers different levels of economic development and cultural diversity (Baltagi, 2005).

The data is from BAZNAS's annual financial reports, available at www.baznas.go.id and BPS (BPS—Statistics Indonesia), accessed at www.bps.go.id. The data period is from 2013 to 2022, allowing for the observation of long-term trends in the collection, management, and distribution of Islamic social funds to assess the impact of these reforms and the growth of Islamic social finance institutions. Detailed descriptions of the data variables are summarized in Table 1.

Table 1 Description of Research Variables

Variable Type	Variable Definition	Proxy	Sources
Dependent Variable	Regional Economy (GRDP)	GRDP at Current Market Prices by Expenditure (annual)	BPS-Statistic
Independent Variable	Islamic Social Fund (DISF)	Total of ZIS & DSKL Distribution (annual) $ISF = total\ distribusi\ dana\ zakat + infaq + sedekah + DSKL$	BAZNAS report
Moderating Variable	Digital Adoption (ICT)	Information & Communication Technology Development Index includes access & adoption ICT intensity (annual)	BPS-Statistic and kominfo.go.id
Control Variable	Population (POP) Inequality (GINI) Unemployment (UNEM)	Total Population (annual) GINI Index Unemployment (annual)	BPS-Statistic

Specification Empirical Models

In this empirical research, the specification models use the total Islamic social fund distribution as the independent variable. Control variables include total population, unemployment, and the GINI index. The dependent variable in this research is regional economic growth. A panel regression model is employed to test all hypotheses, following the econometric guidelines outlined by Gujarati & Porter (2012). This research employs a two-way fixed effects model to analyze the impact of Islamic Social Fund distribution on the regional economy. This method is suitable for evaluating the effect of the intervention because it controls for changes over time that affect all entities (Baltagi, 2005) , as well as unique characteristics of each entity that could confuse the results, as outlined in Model (1). By incorporating fixed effects for the interaction between digital adoption (ICT) and Islamic Social Fund distribution, the analysis investigates how digital adoption (ICT) affects the relationship between ISFs and economic regional (GRDP), based on Gheraia et al., (2022). The equations presented detail the models that illustrate these moderating effects.

$$GRDP_{it} = \beta_0 + \beta_1 DISF_{it} + \beta_2 ICT_{it} + \beta_3 DZIS * ICT_{it} + \beta_4 Pop_{it} + \beta_5 Unem_{it} + \beta_6 GINI_{it} + \varepsilon_{it}$$

Note: GRDP = regional economy at Current Market Prices by Expenditure; DISF = Islamic Social Finance Distribution; ICT = ICT Development Index; DZIS*ICT = Interaction of ISF and ICT; Pop = Population; Unem = Unemployment; GINI = Gini Index; i = province t = periods, β_0 = constant term; $\beta_1, \beta_2, \ldots \beta_6$ = coefficient of independent variables; and ε = error term.

Result and Discussion

Descriptive Statistics

Descriptive statistical analysis summarizes quantitative data, including minimum, maximum, mean, and standard deviation values (Ferdinand, 2014). Table 2 presents the processed data for the variables in this research, which draws on a sample of 210 observations to provide descriptive statistics. The independent variable, ISF distribution, and lower ISF distribution potentially result in slower economic growth. Higher digital adoption is driving economic growth. On the other hand, lower digital adoption could hinder economic advancement and contribute to regional disparities in economic development. For macroeconomic variables, higher unemployment levels have potentially harmful effects on the regional economy. Larger populations may provide a broader labor pool and consumer base, stimulating economic activity, and a higher GINI index in certain areas could signal unequal wealth distribution, which may hinder overall economic growth.

Table 3 Descriptive Statistics

Variables	Mean	Median	Max.	Min.	Std. Dev.
Regional Economy	1.898.505	1.867.500	2.139.000	1.672.000	1.267.520
ISF Distribution	2.233.333	2.288.500	2.919.000	1.261.000	3.532.737
Digital Adoption	5.23	5.23	9.24	3.21	1.06
Population	8.551.524	8.500.000	1.081.000	6.720.000	1.080.095
Unemployment	5.22	5.03	9.87	0.88	1.94
GINI Index	0.36	0.36	0.46	0.25	0.04
Observation	210	210	210	210	210

Classical Assumption Test

According to Table 3 and the appendix, the results of the classical assumption testing indicate that the regression model is suitable for analyzing the relationship between the dependent and independent variables. The model demonstrates normal distribution and shows no signs of multicollinearity.

Table 3 Results of the Pearson Correlation Coefficient test

	DSIF	ICT	POP	UNEM	GINI
Zakat Distribution	1				
Digital Adoption	0.4465	1			
Population	0.3641	0.2158	1		
Unemployment	0.1627	0.1592	0.3017	1	
GINI Index	-0.0924	0.1727	0.2092	0.1427	1

Analysis of the Empirical Results

This benchmark model examines how Islamic social fund distribution and digital adoption impact regional economy. Table 4 presents the results of the panel regression analysis using a fixed-effects model.

Table 4 Results of Model Regression

Variables	Model
	GRDP
DISF	0.1131
	(0.000)
ICT	0.2097
	(0.005)
DSIF * ICT	0.3859
	(0.018)
POP	6.1816
	(0.000)
UNEM	-1.1619
	(0.019)
GINI	-6.4224
	(0.017)
Adjusted R^2	0.7978
N	210

All variables indicate statistical significance at the level of 5%

This model analyses Islamic social fund distribution's effect on regional economic growth. Table 4 displays the results of the panel regression analysis. Model 1 presents the results of the moderating effect of digital adoption (ICT), which examines the significant positive impact of Islamic social fund distribution and regional economy (β = 0.3859, p = 0.018). The findings also introduce an interaction term between Islamic social fund distribution and digital adoption (DISF * ICT), which proves that the digital adoption variable (ICT) has a semi-moderating effect so that the impact of digital adoption (ICT development) can strengthen the effectiveness of ISF distribution and increase economic regional in Indonesia during 2013-2022, providing empirical support for hypothesis H3. This result suggests that as the distribution of Islamic social funds increases, regional economies also tend to improve disposable income among beneficiaries. Then, increased digital use and access will enhance ISF distribution mechanisms by making them more efficient, transparent, and accessible, thus maximizing their economic impact.

Effect of Islamic Social Fund Distribution on Regional Economic Growth

The result in Table 4 shows that the total distribution of ISF affects the regional economy in 21 provinces in Indonesia, which is positive and significant. Table 5 shows that the total distribution of Islamic social funds (ISF) has a positive and significant impact on the regional economy across 21 provinces in Indonesia. This suggests that ISF plays a crucial role in enhancing the regional economy.

Regional economy reflects an even distribution of income, an increase in the production of goods and services, and the achievement of community welfare within a region. Islamic financial instruments through income distribution help overcome various economic problems (Amalia & Huda, 2020). Income distribution occurs when individuals or entities with excess assets channel their wealth through social funds, providing financial resources to those in need. This approach ensures that income is distributed relatively and proportionally across all levels of society. However, it does not mean that every individual gets the same income, but rather an effort to reduce economic disparities. Income equality will affect the increasing purchasing power of the community, which encourages the production of goods and services and strengthens the regional economy.

The evidence indicates that ISF supports income distribution and stimulates economic activity (Firdaus et al., 2012). Previous studies by Suprayitno (2020) and Saputro & Sidiq (2020) also affirm the positive impact of Islamic social funds on national economic growth. Lahuri et al. (2021) note that economic growth can be significantly enhanced, aligning with Mahat & Warokka (2013), who found a strong Pearson correlation (about 0.809) between zakat and GDP in a research of 19 Muslim countries from 2004 to 2010. This finding is consistent with research by Ashfahany et al., (2023); Jedidia & Guerbouj, (2021); Sudrajat, (2023), which highlights the positive correlation between Islamic social fund instruments and economic development. To fully harness the potential of Islamic social funds in Indonesia, optimizing their use by leveraging the population's role, reducing unemployment growth, and maintaining a low GINI index is essential.

Effect of Digital Adoption on Regional Economy

Table 4 shows that the relationship between digital adoption and economic regional development in Indonesia is positive and significant in 21 sample provinces.

Digital adoption is how individuals, organizations, or communities integrate digital technology into their daily activities, whether in personal life, business, or government (Autio & Fu, 2022). This process includes software, online platforms, and information and communication technology (ICT). Digital adoption can occur in various sectors, including the education sector, which uses online learning (e-learning) platforms that improve teaching and enhance learning (Mhlongo & Mbatha, 2023); the health sector, which utilizes telemedicine technology to allow patients to consult with doctors online, the economic sector with e-commerce will expand the market and facilitate the process of buying and selling products and services, while in the government administration sector which is more effective and efficient through online administration (Kateb & Ruehle, 2022). Digital adoption is the key to driving innovation, increasing efficiency and productivity, and opening up new economic opportunities. With the proper infrastructure, adequate digital skills, and supportive policies, appropriate digital adoption in each sector can accelerate growth in various sectors and provide long-term benefits to society and the economy.

The results of this research align with the research by (Bahrini & Qaffas, 2019; Farhadi et al., 2012; Magoutas et al., 2024) The findings show that the effect of ICT usage on the regional economy is positive and prove that access to fixed telephones, other ICT such as mobile phones, internet usage, and digital or internet adoption are the main drivers of the regional economy. And Magoutas et al., (2024) showed that improvements in ICT access have a significant positive effect on productivity and the regional economy. Then, Sultanuzzaman et al. (2019) concluded that technological access impacts the economic performance of developing countries in Asia.

Examination of the Moderating Effect of the Digital Adoption

The result shows the potential moderating role of digital adoption or ICT development in the relationship between the distribution of ISF and the regional economy. Table 4 presents the results of the moderating effect of digital adoption, which are positive and significant. ICT access and uses have been crucial in enhancing ISF distribution's efficiency, transparency, and reach. Digital platforms have facilitated more accessible and transparent collection and distribution of funds, leading to better targeting of beneficiaries and more effective use of funds. The positive and significant moderating effect of digital adoption in the relationship between ISF distribution and regional economic growth underscores the transformative role of technology in enhancing digital platforms for collecting and distributing Islamic social funds. Organizations can optimize the fund distribution process by leveraging technology, reducing administrative costs and time delays. This efficiency ensures that funds reach beneficiaries promptly, allowing for more timely economic support, which can stimulate local economies.

The results of the potential moderating role of ICT development align with the research by (Gheraia et al., 2022) that investigates the financial development interaction term with ICT diffusion, which has a positive and statistically significant effect on the regional economy in Saudi Arabia from 1990 to 2019. The research by (Behera et al., 2024) examined the direct and indirect effects of ICT on the regional economy and found that the interaction effect between ICT and financial development is significant in the regional economy.

Endogeneity test results

This research explores how different aspects of Islamic social finance distribution influence regional economies. The endogeneity test is essential in this research to ensure that the relationship between Islamic social finance distribution and regional economic growth is not biased by reverse causality (Baltagi, 2005). The results of the endogeneity test, presented in Table 5, demonstrate that the impact of Islamic social finance distribution on regional economic conditions remains statistically significant ($\beta = 0.0433$, $p < 0.05$), even after addressing potential endogeneity issues. This finding underscores the robustness and reliability of the research conclusions, affirming the significance of Islamic social finance in influencing regional economic development.

Table 5 Results of the Endogeneity test

	Model 1
	GRDP
DISF	0.0433
	(0.000)
POP	9.0902
	(0.000)
UNEM	9.1565
	(0.000)
GINI	2.1557
	(0.018)
Adjusted R^2	0.7995
N	210

All variables indicate statistical significance at the level of 5%

Robustness Checks

This research includes two additional macroeconomic variables for robustness checks: population, unemployment, and GINI. This research uses these tests to ensure that the estimations in the empirical analysis are consistent. The findings from the panel regression model indicate a significant relationship between ISF distribution and regional economy (Table 6). Therefore, the panel regression results confirm that the models used in this research are robust, demonstrating the resilience and reliability of the empirical results.

Table 6 Robustness Analysis based on Period

Period	2013-2022	2014-2022	2015-2022	2016-2022	2017-2022
DISF	0.1131	0.0203	0.0158	0.0369	0.0436
	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)
POP	6.1816	9.3160	8.3967	8.6048	9.0858
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
UNEM	-1.1619	-0.8742	-1.1976	-1.1814	-1.7313
	(0.019)	(0.105)	(0.018)	(0.017)	(0.030)
GINI	-6.4224	-9.9658	-5.0298	-5.3303	-3.4396
	(0.017)	(0.001)	(0.062)	(0.045)	(0.042)
Adjusted R^2	0.7978	0.7450	0.7598	0.7774	0.7474
N	210	189	168	147	126

All variables indicate statistical significance at the level of 5%

Heterogeneity Analysis

Provinces with advantageous geographical locations often benefit from efficient access to ICT, well-developed digital infrastructure, a robust financial ecosystem, effective community development programs, prioritized poverty reduction initiatives, and comprehensive legal frameworks. Consequently, these provinces generally exhibit moderate to high levels of ICT development. However, due to Indonesia's sizeable geographic expanse, there is considerable regional development disparity, resulting in uneven distribution of ISF and varying levels of ICT development across provinces. This research explores how regional variations in ISF distribution, influenced by digital and technology development, affect the regional economy.

Table 7 Regional Heterogeneity Analysis Based on Fundraising Areas

	Full sample (21)	Regional 1 (5)	Regional 2 (8)	Regional 3 (8)
	GRDP	GRDP	GRDP	GRDP
DISF	0.1131	0.0026	0.0196	0.0094
	(0.000)	(0.088)	(0.000)	(0.002)
ICT	0.2097	8.2703	3.3216	5.3757
	(0.005)	(0.033)	(0.000)	(0.008)
POP	6.1816	3.5640	7.5769	1.2050
	(0.000)	(0.015)	(0.000)	(0.000)
UNEM	-1.1619	-0.7058	-0.8453	-1.0164
	(0.019)	(0.046)	(0.015)	(0.098)
GINI	-6.4224	-2.1069	-6.7729	-4.8352
	(0.017)	(0.072)	(0.027)	(0.020)
Adjusted R^2	0.7978	0.7789	0.7982	0.7967
N	210	50	80	80

Note: reg.1 Sumatera, reg. 2 Jawa Bali NTB, reg.2 Kalimantan, Sulawesi, Papua.

In this research, we divide 21 provinces in Indonesia into five eastern regions, eight central regions, and eight western regions, further classifying them based on ISF fundraising rankings. In this research, we categorize 21 provinces in Indonesia into five eastern areas (West Sumatra, South Sumatra, Riau, Bangka Belitung, NAB), eight central regions (DKI

Jakarta, West Java, Central Java, Yogyakarta (DIY), East Java, Banten, Bali, West Nusa Tenggara/NTB), and eight western regions (Central Kalimantan, South Kalimantan, East Kalimantan, North Kalimantan, North Sulawesi, Gorontalo, North Maluku, West Papua). These provinces were further classified into ISF fundraising areas based on the *Indikator Pemetaan Potensi ZIS* (Puskas BAZNAS, 2019).

The regional heterogeneity analysis results for the baseline model are presented in Table 7, highlighting how the impact of ISF distribution and ICT varies across different regions. The analysis reveals significant geographical differences in how regional ISF distribution influences economic growth. In the eastern region, the effect of ISF distribution on economic growth is insignificant at the 5% level. In contrast, the central region shows a more pronounced and statistically significant effect between ISF distribution and economic growth. The western region exhibits the most notable impact, which is important at the 5% level. These differences are likely due to variations in ICT levels, with the central region leading in ICT access and infrastructure, followed by the western and eastern areas.

Conclusion

This research examines how the adoption of digital technology influences the use of Islamic social finance (ISF) to promote economic regional. It assesses how integrating digital tools and platforms can enhance the efficiency and outreach of Islamic social finance mechanisms, such as *zakat*, *infaq*, and *sadaqah*, in driving economic development. The empirical analysis, based on a panel regression model covering the period from 2013 to 2022 in Indonesia, shows that ISF distribution can boost national income, with its effectiveness further increased by digital adoption or ICT development in Indonesia.

These findings have significant implications for economic policy in Muslim countries. Leveraging ISF to enhance the regional economy, authorities should focus on improving literacy and knowledge about ISF. This improvement would increase individuals' intention, ability, and willingness to contribute through institutions. Additionally, government intervention in the collection and distribution of ISF, particularly Zakat, should be strengthened to maximize its impact on the regional economy. The increasing demand for adequate community support and development initiatives necessitates higher-quality services from ISF and Islamic philanthropy institutions in Indonesia. This research highlights the positive impact of digital technology adoption on the effectiveness of Islamic social finance (ISF) in fostering a regional economy. Islamic social finance institutions should focus on enhancing digital literacy and engagement by providing training and developing user-friendly platforms to capitalize on these benefits. Implementing advanced digital tools like data analytics and blockchain technology can improve transparency and efficiency. Strengthening collaboration with government authorities, improving service quality, and addressing regional disparities through targeted programs and infrastructure development are also crucial. Continuous

monitoring, evaluation, and feedback mechanisms are essential to ensure that ISF programs remain effective and responsive to the community's needs.

However, this research has several limitations. It is confined to data from 21 provinces in Indonesia, suggesting that future research could encompass all provinces for a more comprehensive analysis. Additionally, it primarily relies on static data, which may need to fully capture the effects of policy changes, risks, technology, and digitization on philanthropy institutions. Moreover, the empirical models used may only partially reflect the complexities of real-world scenarios.

Author Contributions

Conceptualization, A.M. and J.Z; Methodology, A.M.; Investigation, A.M. and J.Z.; Analysis, A.M., J.Z., R.S.L., and L.A.N; Original draft preparation, A.M., J.Z., R.S.L., and L.A.N.; Review and editing, A.M., J.Z., R.S.L., and L.A.N.; Visualization, A.M., and J.Z. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

References

Al-Faizin, A. W., Insani, T. D., & Widiastuti, T. (2017). Zakat as an obligatory system and its implications for social psychology of society (Social tafsīr of Sūrah Al-Tawbah: 103). *International Journal of Zakat, 2*(2), 43–53.

Amalia, R. Y., & Huda, N. (2020). Role of zakat in achieving Sustainable Development Goals (SDGs) in Indonesia. *International Journal of Zakat and Islamic Philanthropy, 2*(2), 199–204.

Anggraini, R. (2016). *Analisis pengaruh dana zakat, infaq, shodaqoh (ZIS) dan inflasi terhadap pertumbuhan ekonomi di Indonesia pada periode 2011–2015* [Undergraduate thesis]. Surabaya.

Ardhiastuti, Y. (2018). *Analisis pengaruh zakat terhadap peningkatan pendapatan mustahiq* [Undergraduate thesis]. Surakarta.

Ashfahany, A. E., Hidayah, A. D. N., Hakim, L., & Mohd Noh, M. S. B. (2023). How zakat affects economic growth in three Islamic countries. *Journal of Islamic Economic Laws, 6*(1), 45–61. https://doi.org/10.23917/jisel.v6i1.21242

Bahrini, R., & Qaffas, A. A. (2019). Impact of information and communication technology on economic growth: Evidence from developing countries. *Economies, 7*(1). https://doi.org/10.3390/economies7010021

Behera, B., Haldar, A., & Sethi, N. (2024). Investigating the direct and indirect effects of information and communication technology on economic growth in the emerging economies: Role of financial development, foreign direct investment, innovation, and institutional quality. *Information Technology for Development, 30*(1), 33–56. https://doi.org/10.1080/02681102.2023.2233463

Fajarudin, I. (2019). Kontribusi zakat sebagai pendapatan negara dan instrumen penerimaan pajak (Studi interpretif). *Paradigma Accountancy, 2*(1), 25–38.

Farhadi, M., Ismail, R., & Fooladi, M. (2012). Information and communication technology use and economic growth. *PLoS ONE, 7*(11). https://doi.org/10.1371/journal.pone.0048903

Ferdinand, A. (2014). *Metode penelitian manajemen*. Badan Penerbit Universitas Diponegoro.

Firdaus, M., Beik, I. S., Irawan, T., & Juanda, B. (2012). Economic estimation and determinations of zakat potential in Indonesia. *IRTI Working Paper Series WP 1433-07*(August), 1–74.

Gheraia, Z., Abid, M., Sekrafi, H., & Abdelli, H. (2022). The moderating role of ICT diffusion between financial development and economic growth: A bootstrap ARDL approach in Saudi Arabia. *Information Technology for Development, 28*(4), 816–836. https://doi.org/10.1080/02681102.2021.1998759

Gujarati, D. N., & Porter, D. C. (2012). *Buku 1 dasar-dasar ekonometrika* (5th ed.). Salemba Empat.

Indrawan, I. W., & Herman, S. (2017). Integrated zakat and waqf model for refugees (IZWMR), proposal to improve livelihood of global refugees. *Conference Paper*, 1–10.

Jedidia, K. B., & Guerbouj, K. (2021). Effects of zakat on the economic growth in selected Islamic countries: Empirical evidence. *International Journal of Development Issues, 20*(1), 126–142. https://doi.org/10.1108/IJDI-05-2020-0100

bin Lahuri, S., Syamsuri, Kamaluddin, I., & Wulandari, Y. (2021). The role of zakat and waqf in Sustainable Development Goals (SDGs). *Albukhary Social Business Journal, 2*(2), 34–41. https://doi.org/10.55862/asbjv2i2a004

Magoutas, A. I., Chaideftou, M., Skandali, D., & Chountalas, P. T. (2024). Digital progression and economic growth: Analyzing the impact of ICT advancements on the GDP of European Union countries. *Economies, 12*(3), 1–17. https://doi.org/10.3390/economies12030063

Mahat, N. I., & Warokka, A. (2013). Investigation on zakat as an indicator for Moslem countries' economic growth. *Journal for Global Business Advancement, 6*(1), 50–58. https://doi.org/10.1504/JGBA.2013.053478

Mankiw, N. G., Quah, E., & Wilson, P. (2012). *Pengantar ekonomi makro*. Salemba Empat.

Munandar, E., Amirullah, M., & Nurochani, N. (2020). Pengaruh penyaluran dana zakat, infak dan sedekah (ZIS) dan pertumbuhan ekonomi terhadap tingkat kemiskinan. *Al-Mal: Jurnal Akuntansi dan Keuangan Islam, 1*(1), 25–38.

Qudah, M. R. M., Munir, A. R., Sobarsyah, M., & Sabbar, S. D. (2022). The role of zakat, Islamic human development, and government support on the economic growth in Jordan. *Cuadernos de Economia, 45*(128).

Saputro, E. G., & Sidiq, S. (2020). The role of zakat, infaq and shadaqah (ZIS) in reducing poverty in Aceh Province. *International Journal of Islamic Economics and Finance (IJIEF), 3*(3), 63–94. https://doi.org/10.18196/ijief.3234

Sudrajat, B. (2023). The impact of Islamic social finance on economic growth in Indonesia: A ZISWAF development model approach. *Cuadernos de Economia, 46*(131), 156–164.

Sulaeman, R. M., & Widiastuti, T. (2021). The impact of zakat on socio-economic welfare before COVID-19 pandemic in Indonesia: A quantitative study. *International Journal of Zakat, 6*(2), 75–90. https://doi.org/10.37706/ijaz.v6i2.301

Suprayitno, E. (2020). The impact of zakat on economic growth in 5 state in Indonesia. *International Journal of Islamic Banking and Finance Research, 4*(1), 1–7. https://doi.org/10.46281/ijibfr.v4i1.470

Suriani, S., Riyaldi, M. H., Nurdin, R., Fadliansah, O., & Wintara, H. (2021). Zakat and sustainable development: Effect of zakat and macroeconomic variables on dependency ratio and poverty. *2021 International Conference on Decision Aid Sciences and Application (DASA 2021),* 392–396. https://doi.org/10.1109/DASA53625.2021.9682377

Todaro, M. P., & Smith, S. C. (2020). *Economic development* (13th ed.).