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Islamic Philanthropy and Regional Socioeconomic Development: Evidence from Indonesian Provinces

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Abstract: Earlier studies have examined relationships between Islamic philanthropy and poverty, recorded crimes, and regional output separately. This study considers these in combination for the case of Indonesian provinces. The measure for Islamic philanthropy is defined as the annual provincial distribution of *zakat*, *infaq*, *sadaqah*, and other religious social funds, reported by the National *Zakat* Board (BAZNAS). A balanced panel of 30 provinces, for the period 2018 to 2024, is considered. Three two-way fixed-effect models, with province-clustered standard errors, were estimated. The wild cluster bootstrap and Driscoll-Kraay standard errors are considered as robustness checks. The association between Islamic philanthropy distribution and real Gross Regional Domestic Product (real GRDP) is positive, with an elasticity of about 0.03, which holds across the methods of inference. The Islamic philanthropy distribution is not significantly associated with the poverty rate. Its association with recorded criminal offenses is positive, but not robust. The poverty rate is not significantly related to recorded criminal offenses, and neither variable is positively and robustly associated with real GRDP. Associations estimated without year effects may capture common national trends. Reporting by programs and the status of beneficiaries in terms of poverty may help determine the effect of philanthropy on poverty and recorded crimes.

Keywords: *Islamic social finance; zakat, infaq, and sadaqah; recorded criminal offenses; real GRDP*

Abstrak: *Studi-studi sebelumnya telah meneliti hubungan antara filantropi Islam dengan kemiskinan, angka kriminalitas, serta output regional secara terpisah. Studi ini mengkaji variabel-variabel tersebut secara bersamaan, dengan mengambil konteks provinsi-provinsi di Indonesia. Filantropi Islam diukur berdasarkan distribusi tahunan zakat, infaq, sedekah, dan dana sosial keagamaan lainnya di tingkat provinsi, sebagaimana dilaporkan oleh Badan Amil Zakat Nasional (BAZNAS). Penelitian ini menggunakan data panel seimbang yang mencakup 30 provinsi selama periode 2018 hingga 2024. Tiga model dua arah diestimasi dengan menggunakan yang dikelompokkan berdasarkan. Sebagai uji ketahanan digunakan metode*

dan Driscoll-Kraay. Hasil penelitian menunjukkan adanya hubungan positif antara distribusi filantropi Islam dan Produk Domestik Regional Bruto (PDRB) riil, dengan elastisitas sekitar 0,03—hasil yang konsisten di berbagai metode inferensi. Distribusi filantropi Islam tidak memiliki hubungan yang signifikan dengan tingkat kemiskinan. Hubungannya dengan angka kriminalitas tercatat bersifat positif, namun tidak kokoh. Tingkat kemiskinan tidak memiliki hubungan yang signifikan dengan angka kriminalitas, dan tidak ada satu pun dari kedua variabel tersebut yang memiliki hubungan positif yang kokoh dengan PDRB riil. Estimasi yang dilakukan tanpa menyertakan efek tahun mungkin menangkap tren nasional yang bersifat umum. Pelaporan berdasarkan jenis program serta status kemiskinan penerima manfaat dapat membantu menentukan dampak filantropi terhadap kemiskinan dan angka kriminalitas.

Kata kunci: *keuangan sosial Islam; zakat, infak, dan sedekah; tindak pidana tercatat; PDRB riil*

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INTRODUCTION

The level of poverty in Indonesia decreased from 9.82% in March 2018 to 9.03% in March 2024, but rose to 10.14% in March 2021 (BPS, 2024). During the same period, recorded crimes increased from 294,281 cases in 2018 to 561,993 in 2024 (BPS, 2020, 2025b). The national economy of the country registered a growth of 5.17% in 2018 and 5.03% in 2024 (BPS, 2019; BPS, 2025a). While the association between crime and poverty is pretty clear, their opposing trends indicate that other factors influence crime independently of poverty (Dunn, 2025).

The measures also differ. Crime statistics depend on victim reporting and police registration. However, the poverty rate does not capture how far households fall below the poverty line. Both measures matter when evaluating resources directed to poor households (Sugiharti et al., 2023). These resources include religious charitable funds (Bonang et al., 2026) such as *zakat*, *infaq* and *sadaqah*.

Most studies of these funds focus on poverty and growth. Some studies find positive associations between growth and zakat, alone or with infaq and sadaqah (Safitri et al., 2024; Siswantoro & Ikhwan, 2023; Sudrajat, 2023). However Khasandy and Badrudin (2019) have shown that these funds do not affect growth. Crime has received less attention, despite its link to deprivation. These outcomes relate to Sustainable Development Goals (SDGs), especially Goal 1 (poverty) and Goal 8 (decent work and economic growth), and partially Goal 16 (peaceful societies) (Sodhi & Tang, 2024).

Zakat, infaq, sadaqah, and other Islamic philanthropy may finance development in Muslim-majority countries. They may reduce poverty and inequality, support development, strengthen community stability, and aid recovery from economic shocks (Siswantoro & Ikhwan, 2023; Malik, 2016). Economic theories of crime suggest that economic conditions can affect offending (Becker, 1968). Potential offenders weigh expected benefits against legal consequences. Poverty does not imply criminality. However, the evidence shows that the theory of social disorganization (Shaw & McKay, 1942) suggests that poverty can contribute to crime.

Evidence across Indonesian provinces is mixed. Across 34 provinces in 2012–2020, Purnomo et al. (2023) find no significant relationship between poverty and crime. However, using a generalized method of moments (GMM) approach for the

same 34 provinces and period, Sugiharti et al. (2023) show that all of their measures of poverty are positively correlated with crime, and that poverty depth and severity are more important than the headcount. These differences may reflect indicators, periods, and methods. Poverty is associated with lower economic performance. Amar et al. (2022) find that, for 19 districts and municipalities in West Sumatra, higher poverty levels are associated with lower economic growth. Zhu et al. (2022) get a similar result for Vietnam, and the effect becomes insignificant after considering employment.

This literature has three gaps, first empirical. *Zakat, infaq,* and *sadaqah* have been studied separately from linkages to poverty, crime, and growth. The second concerns measurement. Among the studies assessed, only Hidayat (2024) measures Islamic philanthropy by the amount of funds collected, which may reflect regional income levels and donors' ability to give. This study instead uses the distributed funds, which better reflects the redistributive mechanism. Distribution does not eliminate identification concerns because it is closely related to collection.

The gap is about the mechanisms linking Islamic philanthropy to regional socioeconomic conditions. In theory, these associations might work either directly through the demand side (household expenditure and business capital) or through the supply side (improvements in socioeconomic conditions and reductions in poverty, which are connected to crime, as stated by Sya'rawi (2005). In this case, Islamic philanthropy is defined by the distribution of *zakat*, *infaq*, and *sadaqah*, and other religious social funds. These distributions can improve the welfare of the households and the regional economy, but their effects on poverty and crime are unknown.

This study examines these relationships without presupposing that Islamic philanthropy reduces crime and increases public safety (Siswantoro & Ikhwan, 2023; Malik, 2016). The design identifies provincial associations but not mediation. Three questions guide the analysis. First, is the distribution of Islamic philanthropy associated with the poverty rate, which is the first link in the chain from Islamic philanthropy to crime and real Gross Regional Domestic Product (GRDP)? Second, does this association hold at the provincial level in Indonesia? Third, is there an association among real GRDP, poverty rate, recorded crime, and the distribution of Islamic philanthropy?

They are examined using a balanced panel of 30 provinces for 2018–2024. It differs by measuring distribution rather than collection, and by analyzing relationships with poverty, recorded criminal offenses, and real GRDP within a single provincial panel. The findings inform zakat institutions and local governments that use philanthropic data to assess community welfare and security. Recorded criminal offenses refer to the total reported by regional police commands. Public security is broader and not measured directly. Fewer recorded offenses capture only one dimension.

LITERATURE REVIEW

Religious Social Funds as a Redistributive Transfer

Zakat is an obligatory transfer of wealth to eight categories of recipients. *Infak* and *sadaqah* are voluntary. One purpose of *infaq* and *sadaqah* is to assist vulnerable households in meeting their basic needs and to enable the establishment or operation of small enterprises. This function is aligned with the objective of *maqasid*

al shar'ia, particularly protection of life and protection of wealth (Abdullah, 2018; Intezar & Zia, 2022; Khan & Haneef, 2022; Tahiri Jouti, 2019; Tok et al., 2022; Widiastuti et al., 2022). Numerous studies have assessed the impact of Islamic philanthropy on economic growth, and findings of most of these studies point to a positive impact. Ben Jedidia and Guerbouj (2021) used a dynamic panel GMM method for eight Muslim countries over the period 2004 to 2017, and found a positive impact of *zakat* on economic growth for most of these countries. Other studies found positive growth impacts from the distribution of *zakat*. For instance, using a VECM on monthly Indonesian data for 2013 to 2022, Pebruary and Hani'ah (2024) found that the distribution of *zakat* had a positive effect on economic growth. Using monthly data for the period from January 2011 to December 2019, Prawoto and Basuki (2024) also found a positive long-run impact of zakat distribution on Indonesia's Gross Domestic Product.

Siswantoro and Ikhwan (2023) use an error-correction model to analyze annual data from 2002 to 2022. Their model indicates that *zakat*, *infaq* and *sadaqah* tend to foster economic growth in the long run. Sudrajat (2023) implements a dynamic ARDL model to analyze the growth impact of *zakat*, *sadaqah*, *waqf*, and *infaq* from 1991 to 2022 and corroborates to Siswantoro and Ikhwan (2023). From partial least squares structural equation modeling of Indonesian data from 2011 to 2016, Khasandy and Badrudin (2019) also report no impact of *zakat* on growth and welfare. The relationship between Islamic philanthropy and economic performance relies on the indicators used. Evidence concerning Islamic philanthropy and poverty is scant and requires improvement. Herianingrum et al. (2023) analyze the impact of the *zakat* empowerment program on poverty.

Using panel data for 28 provinces over 2017–2018, Choiriyah et al. (2020) show that *zakat* impact, measured by the Welfare Index of the National *Zakat* Board (Badan *Amil Zakat* Nasional, BAZNAS), significantly reduces the proportion of the population in poverty (P0) but has no significant effect on poverty depth (P1) or severity (P2). At the recipient level, Ayuniyyah et al. (2025) emphasize the role of zakat administrators (amil) in mentoring to improve *mustahik* welfare. Whether distribution is related to poverty at the provincial level therefore remains an open empirical question. Based on these arguments and findings, Islamic philanthropy distribution is expected to be negatively associated with the provincial poverty rate, although the direction and size of this association must be established empirically.
H1: Islamic philanthropy distribution is negatively associated with the poverty rate.

Economic Theory of Crime and Strain Theory

Two theoretical traditions link economic hardship to criminal offending. In the economics of crime, Becker (1968) models the decision to offend as a rational comparison of expected benefits and expected costs, including the risk of arrest and legal sanctions. Becker (1968) was the first to examine the economics of crime by incorporating the expected costs and benefits of crime in the decision to offend. The cost-benefit analysis includes the risk of apprehension and the cost of the crime (if caught). Crime is more attractive if a person has fewer opportunities for a legitimate income. However, crime becomes less attractive with a stronger economy and more opportunities. Crime is also less attractive with a more law-abiding social status. Crime is more attractive when people are more socially and economically distressed. This could also include crime driven by social aggression. General strain theory

(Agnew, 1992) posits that strain caused by the inability to achieve valued goals, losing valued things, or experiencing negative situations or environments can produce emotions that motivate crime. Both theories suggest that providing a financial safety net to distressed people could help alleviate the financial strain and, therefore, help minimize the motivation to commit crime.

There is generally solid evidence to support this view, though the consequences of social assistance programs depend on the type of crime committed and the details of program design. Chioda et al. (2016) find that Brazil's Bolsa Família program reduced crime. More recent studies show varying effects and point out the importance of design details. Timing of payment for the U.S. food stamps program impacted crime and theft at grocery stores (Carr & Packham, 2019) and emergency financial assistance in Chicago reduced violence and property crime (Palmer et al., 2019) effects of cash dividends in Alaska showed small, counterintuitive effects with less property crime and more substance abuse (Watson et al., 2020). Islamic philanthropy may function in a similar manner as mentioned earlier, and Sya'rawi (2005) argues that *zakat* directed at the needy and the poor may help meet basic needs, thus relieve financial pressure and deter economically motivated crime. It is therefore important to look at the effects of the poverty rate. Therefore, the second hypothesis is:

H2: Islamic philanthropy distribution is negatively associated with recorded criminal offenses.

Poverty and Recorded Criminal Offenses

Being poor means you don't have enough to meet your basic needs. But being poor may be related to economic stress and criminal behaviors. In his social strain theory, Merton (1938) suggests that people may choose other (i.e., criminal) means when they are unable to achieve their goals because of a lack of legitimate means. The social disorganization theory by Shaw and McKay (1942) suggests that if the level of poverty is high in an area, if the population of the area is stable, and the community is poorly organized, the community will be unable to regulate itself and control social deviance, including crime. This theory is closely related to poverty. Becker (1968) suggests that if legitimate opportunities for gaining a living do not exist, the expected benefits from illegal activities will outweigh the gains from legal activities after considering the costs of apprehension and punishment. Failure to achieve goals or lose valued possessions or conditions results in negative emotions that increase the likelihood of deviant behavior, according to Agnew (1992). Following this theory, Foley (2011) describes how financial crime is committed during monthly benefit payment cycles in 12 US cities.

Kelly (2000) argues that there is a strong relationship between poverty and property crimes in US urban counties but a weak relationship between poverty and violence. There are contradictory findings from Indonesia; while Sugiharti et al. (2023) show a positive relationship between poverty and crimes, in Purnomo et al. (2023), there is no significant relationship between the two. It is therefore necessary to review the relationship between poverty and crime for various regions and consider the indicators used. Therefore, this study examines the relationship between the poverty rate and crime in the Indonesian provinces. The third hypothesis is therefore:

H3: The poverty rate is positively associated with recorded criminal offenses.

Islamic Philanthropy Distribution and Real GRDP

There are two channels through which the distribution of Islamic philanthropy may be associated with a rise in real GRDP: by increasing aggregate demand and through productive activities. Transfers to poor households may stimulate local consumption. Capital support to *mustahik* enterprises may increase production and employment (Alghina et al., 2019; Herianingrum et al., 2023; Muttaqien et al., 2022). Ben Jedidia and Guerbouj (2021) found that the positive relationship between *zakat* and growth in the cross-country GMM was due to the use of *zakat* funds for consumption, investment and government spending. Therefore, these authors also support the view that when *zakat* resources reach the beneficiaries and are used for economy-related activities, the economic activity is also expected to increase.

Since there are different indicators for growth at the national and regional levels, cross-country findings cannot be directly applied to the Indonesian provinces. In this study, the real GRDP indicates regional economic activity. It is expected that the distribution of Islamic philanthropy will strengthen the real GRDP through increased consumption and productive activities, and the size of the effect may depend on the scale of the distribution, use of funds, and the regional economy of each province. Thus, it is important to test the association of the distribution of Islamic philanthropy with the real GRDP of the Indonesian provinces, which tests the fourth hypothesis:

H4: Islamic philanthropy distribution is positively associated with real GRDP.

Poverty and Real GRDP

Ravallion (2012) notes that, with the same average consumption, countries with higher initial poverty levels will, on average, have lower consumption growth. Evidence from West Sumatra and from Vietnam, cited in Amar et al. (2022) and Zhu et al. (2022) respectively, all show a negative relationship between poverty and economic growth. It appears that in the context of Vietnam, this negative relationship loses significance if the employment situation is taken into account Zhu et al. (2022). The open unemployment rate is therefore included as a control variable, although it only partly captures the conditions of the labor market. The fifth hypothesis is:

H5: The poverty rate is negatively associated with real GRDP.

Recorded Criminal Offenses and Real GRDP

Crime negatively impacts economic performance through losses, costs, reduced investment, and firm-level competitiveness (Raj & Kalluru, 2023). Similarly, using Italian data, Detotto and Otranto (2010) show that crime is negatively related to economic growth. However, the reverse may be true, as Sugiharti et al. (2023) find that higher regional income in Indonesia is associated with higher crime rates. This means that as the economy grows, it creates new opportunities for crime. Generally, a negative relationship is expected between criminal offenses and GRDP. A positive relationship, however, suggests a need to consider the economic size and the geographical extent of provinces, rather than as evidence that crime increases economic output. The sixth hypothesis is:

H6: Recorded criminal offenses are negatively associated with real GRDP.

RESEARCH METHOD

Sample and Period

The analysis covers 30 Indonesian provinces in 2018–2024, totaling 210 observations. The sample includes a province only if data for all four study variables were available for all years in the study. The study variables are: distribution of Islamic philanthropy, poverty rate, recorded crime, and the real General Regional Domestic Product (GRDP). The study covers 2018–2024. The data collected in 2024 are incomplete, and data for 2025 were not available at the time of data collection. Data for 2025 are expected to be released no later than 2027. Restricting the observation period to 2018 to 2024 enabled analysis to be performed on complete and comparable data across provinces and years. During the study period, Indonesia had 34 provinces. On 1st January, 2022, the total number of provinces increased to 38 by administratively subdividing a number of the 34 provinces. Eight provinces were not included in the study because they did not meet the sample selection criteria.

South Papua, Central Papua, Highland Papua, and Southwest Papua were established in 2022, and therefore have no separate data for the full study period. The other excluded provinces (East Nusa Tenggara, North Kalimantan, West Sulawesi, and Maluku) had at least one missing value for at least one of the study variables for at least one year. In addition, the statistics for Papua and West Papua are not fully comparable, because starting from 2022, reported data are only for the territories that remained after the division of the provinces. The data series of other provinces remain comparable over the years. Table 1 shows the 30 provinces in the final sample.

Table 1. Provinces included in the panel

No.	Province	No.	Province	No.	Province
1	Aceh	11	DKI Jakarta	21	South Kalimantan
2	North Sumatra	12	West Java	22	East Kalimantan
3	West Sumatra	13	Central Java	23	North Sulawesi
4	Riau	14	D.I Yogyakarta	24	Central Sulawesi
5	Jambi	15	East Java	25	South Sulawesi
6	South Sumatra	16	Banten	26	Southeast Sulawesi
7	Bengkulu	17	Bali	27	Gorontalo
8	Lampung	18	West Nusa Tenggara	28	North Maluku
9	Bangka Belitung	19	West Kalimantan	29	West Papua
10	Riau Islands	20	Central Kalimantan	30	Papua

Note: The panel comprises the 34 pre-2022 provinces excluding East Nusa Tenggara, North Kalimantan, West Sulawesi, and Maluku. After the 2022 division, West Papua and Papua refer to their reduced boundaries. Source: Compiled by the authors (2026)

Variables and Measurement

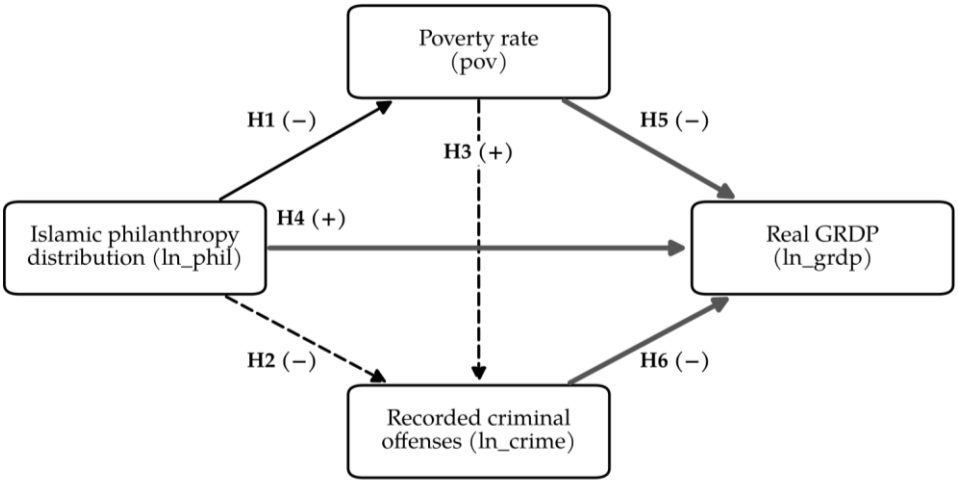


Figure 1. Conceptual model and research equations

Hypotheses are organized in a sequential system of three equations (see Figure 1). Equation 1 explains the relation between the distribution of Islamic philanthropy and the poverty rate (H1). Equation 2 describes the relation between the distribution of Islamic philanthropy and the poverty rate with respect to recorded criminal offenses (H2, H3). Equation 3 completes the system and describes the relation between the distribution of Islamic philanthropy, the poverty rate and recorded criminal offenses with respect to real GRDP (H4, H5, H6). Hypotheses are formulated in a way to provide specific expectation on the sign of the related parameter. Therefore, H6 is required, because in Equation 3 recorded criminal offenses are considered an explanatory variable. Unemployment rate is considered in all the equations as a control variable. Each equation is estimated separately, and mediated (indirect) associations are not considered. Hypotheses are summarized in Table 2.

Table 2. Summary of the Research Hypotheses

Hypothesis	Relationship	Sign	Main supporting literature
H1	Islamic philanthropy distribution → Poverty rate	−	Choiriyah et al. (2020); Herianingrum et al. (2023); Ayuniyyah et al. (2025)
H2	Islamic philanthropy distribution → Recorded criminal offenses	−	Becker (1968); Agnew (1992); Chioda et al. (2016); Sya'rawi (2005); Carr & Packham (2019); Palmer et al. (2019)
H3	Poverty rate → Recorded criminal offenses	+	Merton (1938); Shaw & McKay (1942); Becker (1968); Agnew (1992); Foley (2011); Kelly (2000); Sugiharti et al. (2023)
H4	Islamic philanthropy distribution → Real GRDP	+	Ben Jedidia & Guerbouj (2021); Herianingrum et al. (2023); Alghina et al. (2019); Muttaqien et al. (2022)
H5	Poverty rate → Real GRDP	−	Ravallion (2012); Amar et al. (2022); Zhu et al. (2022)

Hypothesis	Relationship	Sign	Main supporting literature
H6	Recorded criminal offenses → Real GRDP	–	Raj & Kalluru (2023); Detotto & Otranto (2010)

Source: Compiled by the authors (2026)

Table 3 gives the main variables (Islamic philanthropy distribution, poverty rate, recorded criminal offenses, and real GRDP) and the control variable with their respective symbols in the equations and tables. Islamic philanthropy distribution is the annual provincial distribution of *zakat*, *infaq*, *sadaqah* and other religious social funds reported by BAZNAS. It has three defining features: it captures distribution rather than collection; it is a total provincial figure in nominal rupiah; and it is neither expressed per capita, or as a share of GRDP, and is also not inflation-adjusted. In this article, Islamic philanthropy distribution refers to the variable, while *zakat*, *infaq* and *sadaqah* refer to the measures used in the previous studies. In the models, ln_phil, ln_crime and ln_grdp refer to the natural logs of Islamic philanthropy distribution, recorded criminal offenses, and real GRDP, respectively. The poverty rate (pov) and open unemployment rate (unemp) are expressed as percentage points. In Equations 2 and 3, the coefficients of the logged regressors are elasticities, and the coefficients of pov and unemp are approximated to be 100 times the semi-elasticities. In Equation 1, the coefficient of ln_phil indicates the change in the poverty rate, expressed in percentage points, because of a change in its log. Since Islamic philanthropy distribution and real GRDP are expressed in nominal rupiah, all are larger in more populous provinces; Islamic philanthropy distribution is expressed in nominal rupiah, while real GRDP is expressed in 2010 real prices.

Table 3. Variables, operational definitions, and sources

Variable	Role	Definition	Unit	Higher Value	Source
Islamic philanthropy distribution (ln_phil)	Explanatory variable (Equations 1–3)	Annual provincial distribution of zakat, infaq, sadaqah, and other religious social funds	Natural logarithm of nominal provincial total (Rp)	Greater funds distributed	BAZNAS
Poverty rate (pov)	Dependent variable (Equation 1); explanatory variable (Equations 2 and 3)	Percentage of the population living below the provincial poverty line, based on the March survey round	Percentage (%), entered in levels	Higher poverty incidence	Statistics Indonesia (BPS)

Variable	Role	Definition	Unit	Higher Value	Source
Recorded criminal offenses (ln_crime)	Dependent variable (Equation 2); explanatory variable (Equation 3)	Number of criminal offenses recorded by regional police commands	Natural logarithm of the provincial total, expressed in thousands of offenses	More recorded criminal offenses	Statistics Indonesia (BPS), Statistik Kriminal
Real GRDP (ln_grdp)	Dependent variable (Equation 3)	Gross regional domestic product at constant 2010 prices, representing the level of regional economic output rather than its growth rate	Natural logarithm of GRDP (Rp billion)	Greater real regional economic output	Statistics Indonesia (BPS)
Open unemployment rate (unemp)	Control variable (Equations 1–3)	Percentage of the labor force that is unemployed	Percentage (%), entered in levels	Higher open unemployment	Statistics Indonesia (BPS)

Source: Compiled by the authors (2026)

All three equations are estimated as panel regressions with province fixed effects; the main specification also includes year fixed effects (two-way fixed effects, TWFE):

$$pov_{it} = \alpha + \beta_1 \ln_phil_{it} + \beta_2 unemp_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

$$\ln_crime_{it} = \alpha + \gamma_1 \ln_phil_{it} + \gamma_2 pov_{it} + \gamma_3 unemp_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

$$\ln_grdp_{it} = \alpha + \delta_1 \ln_phil_{it} + \delta_2 pov_{it} + \delta_3 \ln_crime_{it} + \delta_4 unemp_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

where i indexes provinces and t indexes years, μi denotes province fixed effects, λt year fixed effects, and εit the error term; variable symbols are defined in Table 3. One-way fixed-effects estimates without λt are also reported for comparison. We choose the estimator based on the Chow, Breusch–Pagan LM, Hausman, and cluster-robust Mundlak tests, and we test the residuals for groupwise heteroskedasticity (modified Wald), first-order autocorrelation (Wooldridge), cross-sectional dependence (Pesaran CD), and normality (Shapiro–Wilk). The bootstrap-t hypothesis test was used for inference, and given the small number of clusters (30), the inference was also checked with the wild cluster bootstrap-t (9,999 replications, Rademacher weights, H_0 imposed) and Driscoll–Kraay standard errors (maximum lag of 2) for further robustness checks. Contrary to the negative association predicted by H2, the TWFE coefficient on ln_phil in the recorded criminal offenses equation (Equation 2) is positive (b = 0.0952; two-tailed p = 0.041), implying that a 10%

increase in Islamic philanthropy distribution is associated with roughly 0.9% more recorded criminal offenses

RESULT AND DISCUSSION

Descriptive Statistics

Descriptive statistics are given in Table 4. The upper panel provides the variables in their original form, and the lower panel provides the variables in their natural log form, which are used in estimation

Table 4. Descriptive statistics

Variable	Unit	Mean	Std. dev.	Minimum	Maximum	N
Recorded criminal offenses	number of offenses	11,751.2	14,035.9	718	87,426	210
Poverty rate (pov)	% of population	9.859	5.122	3.470	27.740	210
Open unemployment rate (unemp)	% of labor force	5.098	1.707	1.400	10.950	210
Islamic philanthropy distribution	Rp	1.83×10^{11}	5.48×10^{11}	6.28×10^{7}	6.12×10^{12}	210
Real GRDP	Rp billion (constant 2010 prices)	377,550.8	501,464.0	25,034.1	2,151,041.0	210
ln_crime	ln (thousands of offenses)	1.995	0.934	−0.331	4.471	210
ln_phil	ln (Rp)	24.365	1.826	17.956	29.442	210
ln_grdp	ln (Rp billion)	12.191	1.105	10.128	14.581	210

Source: Data processed using Stata (2026)

Heterogeneity is considerable across the provinces. The distribution of Islamic philanthropy covers approximately five orders of magnitude. The same is true for recorded crimes. The largest province's GRDP is approximately 86 times larger than the smallest. The open unemployment rate and the poverty rate, however, vary within a more constrained range. To moderate the undue influence of atypical values, recorded crimes and Islamic philanthropy, as well as GRDP, are transformed to their natural logarithms. The poverty rate and the open unemployment rate are left untransformed.

Model Selection and Diagnostic Tests

The specification and diagnostic tests are reported in Table 5. The Chow and Breusch–Pagan LM tests all reject pooled OLS ($p < 0.001$), suggesting that each equation captures domain-specific effects. Random effects are rejected for Equation 1 ($\chi^2 = 3.04$; $p = 0.219$), while fixed effects are indicated for Equations 2 and 3 ($\chi^2 = 27.42$ and 75.11; $p < 0.001$). The conventional Hausman test requires that errors be serially uncorrelated and homoskedastic, conditions that are violated in the data. The

cluster-robust Mundlak test indicates that random effects are violated for Equation 1 (χ^2 = 7.50; p = 0.024) and 2 and 3 (p < 0.001). Hence, fixed effects models are appropriate for all three equations. The fixed effects residuals indicate groupwise heteroskedasticity (modified Wald test, p < 0.001), first-order autocorrelation (Wooldridge test, p ≤ 0.002), cross-sectional dependence (Pesaran CD test, p < 0.001), and non-normality (Shapiro-Wilk test, p < 0.001). Year dummies are jointly significant (p < 0.001) in all equations. After inclusion of year dummies, cross-sectional dependence in Equations 1 and 2 (Pesaran CD = 1.017 and −0.427) is no longer present, suggesting that it is largely the effect of common national shocks; some dependence remains in Equation 3 (Pesaran CD = 4.219; p < 0.001).

Table 5. Specification and diagnostic tests

Test	Model 1	Model 2	Model 3
Chow, F(u_i = 0)	229.99***	24.80***	135.49***
Breusch–Pagan LM, $\bar{\chi}^2$	570.06***	261.82***	256.00***
Hausman, χ^2	3.04 (p = 0.219)	27.42***	75.11***
Mundlak (cluster-robust), χ^2	7.50**	41.55***	131.38***
Modified Wald, $\chi^2(30)$	6647.97***	9603.17***	3223.21***
Wooldridge, F(1, 29)	12.259***	15.814***	23.669***
Pesaran CD, one-way FE	22.017***	18.610***	21.530***
Pesaran CD, two-way FE	1.017	−0.427	4.219***
Year dummies, F(6, 29)	17.38***	30.35***	47.22***

*Note: ** p < 0.05; *** p < 0.01. The Hausman test uses the sigmamore option*

These results generally confirm the TWFE specification described in the Methods, particularly for clustering errors at the provincial level and for the wild cluster bootstrap-t and Driscoll-Kraay standard errors, the latter for Equation 3 mainly. Driscoll-Kraay inference relies on a long time dimension, and this panel has T = 7, so the results are considered supplementary.

Estimation Results

Table 6. Fixed-effects estimates with cluster-robust standard errors

	Model 1		Model 2		Model 3	
	FE	TWFE	FE	TWFE	FE	TWFE
ln_phil	−0.2255**	−0.0567	0.1181**	0.0952**	0.0503***	0.0305**
	(0.0853)	(0.0721)	(0.0464)	(0.0445)	(0.0134)	(0.0146)
Pov			−0.1358***	−0.0035	0.0501	0.0851***
			(0.0206)	(0.0335)	(0.0320)	(0.0244)
ln_crime					0.0596*	−0.0292
					(0.0342)	(0.0296)
Unemp	−0.0342	−0.4008	−0.2233***	−0.0671*	−0.0406***	−0.0196**
	(0.2000)	(0.3621)	(0.0318)	(0.0377)	(0.0099)	(0.0094)

	Model 1		Model 2		Model 3	
Constant	15.527***	13.588***	1.595	0.010	10.560***	10.667***
	(2.607)	(2.315)	(1.182)	(1.177)	(0.479)	(0.462)
Province effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	No	Yes	No	Yes	No	Yes
R^2 within	0.047	0.343	0.305	0.562	0.235	0.430
Obs.	210	210	210	210	210	210

*Note: Standard errors clustered by province in parentheses. * p < 0.10; ** p < 0.05; *** p < 0.01.*

Distribution of Islamic philanthropy and poverty level

In the one-way fixed-effects model, the distribution of Islamic philanthropy was found to be negatively and significantly related to poverty (b = -0.2255, p = 0.013). With the addition of year effects, the coefficient reduced to -0.0567 and was not significant (one-tailed p = 0.219; wild bootstrap p = 0.438, 95% CI [−0.263, 0.083]; Driscoll-Kraay p = 0.308). The year effects for 2018 (the base year) were set at 0. Compared with 2018, the year effects for 2019 and beyond were negative, reaching -1.30 in 2024, while 2020 and 2021 effects were positive and not significant (0.21 and 0.36). The negative year effects are consistent with the increase in poverty during the pandemic period. The unem- poy rate was not significantly related to any fixed effects of Equation 1, and thus H1 is not supported.

Distribution of Islamic philanthropy, poverty, and recorded crime (H2, H3). As expected in H2, there is a negative association between the TWFE coefficient of ln_phil in the model of reported criminal offenses (Equation 2), and therefore, a positive association between Islamic philanthropy and criminal offenses. The TWFE coefficient of ln_phil is positive (b = 0.0952; two-tailed p = 0.041), suggesting that a 10% increase in Islamic philanthropy is associated with a 0.9% increase in reported criminal offenses. This positive association is not robust (wild bootstrap p = 0.124; Driscoll-Kraay p = 0.058; 95% CI = [-0.022, 0.183]). The coefficient of poverty (H3) is negative and significant in the single-effect model (b = -0.1358), and falls to 0.0035 (two-tailed p = 0.918; wild bootstrap p = 0.934) with the inclusion of year effects. In the absence of year effects, the trend in reported criminal offenses is U-shaped. In 2018, reported crimes peaked, and they were relatively lower in 2019-2021, and increased in 2023-2024 (relatively +0.43 and +0.37 log points, respectively). H2 and H3 are therefore not supported.

Islamic philanthropy distribution, the poverty rate, recorded criminal offenses, and real GRDP

Islamic philanthropy distribution is positively related to the real General Regional Domestic Product (GRDP) in all fixed-effects specifications. In the Two-Way Fixed-Effects model, a 10% increase in the average distribution of Islamic philanthropy is associated with approximately 0.3% higher real GRDP (b = 0.0305; one-tailed p = 0.023), and the result is robust to the wild bootstrap (p = 0.010; 95% CI [0.006, 0.080]) and Driscoll-Kraay standard errors (p = 0.014). H4 is therefore supported. Since Equation 3 controls for both poverty and recorded criminal

offenses, the coefficient for Islamic philanthropy reflects an association after these two factors, rather than a total association. The association for poverty is positively significant (b = 0.0851; two-tailed p = 0.002) and contrary to the sign predicted in H5. It does not hold up in the wild bootstrap (p = 0.366) and the 95% confidence set is made up of two disjointed intervals. The wild bootstrap supported an association of approximately 8.9% higher GRDP for each percentage point increase in poverty, and is therefore implausible. Recorded criminal offenses are negatively related to real GRDP (b = −0.0292), but are not statistically significant in the clustered (two-tailed p = 0.332) and wild bootstrap (p = 0.356) cases, and are only significant with Driscoll-Kraay standard errors (p = 0.014). H6 is therefore not valid.

Table 7. Summary of hypothesis tests

Hypothesis	Sign	b	One-tailed p	Wild bootstrap p [95% CI]	D–K p	Decision
H1: ln_phil → pov	−	−0.0567	0.219	0.438 (−0.263; 0.083)	0.308	Not supported
H2: ln_phil → ln_crime	−	0.0952	0.979	0.124 (−0.022; 0.183)	0.058	Not supported
H3: pov → ln_crime	+	−0.0035	0.541	0.934 (−0.090; 0.170)	0.930	Not supported
H4: ln_phil → ln_grdp	+	0.0305	0.023	0.010 (0.006; 0.080)	0.014	Supported
H5: pov → ln_grdp	−	0.0851	0.999	0.366 (−0.043; 0.131) ∪ [0.152, 0.172]	<0.001	Not supported
H6: ln_crime → ln_grdp	−	−0.0292	0.166	0.356 (−0.108; 0.032)	0.014	Not supported

Note: b is the TWFE coefficient. Wild bootstrap and Driscoll–Kraay p-values are two-tailed. For H5, the wild bootstrap 95% confidence set consists of two disjoint intervals.

Discussion

Common Trends, Islamic Philanthropy Distribution, and the Poverty Rate

The inclusion of annual fixed effects weakened several relationships. It suggests there are country-level conditions that remain constant over the years and are partly responsible for simple regression relationships. Over the period 2018-2024, the same shocks affected the different provinces of Indonesia. For example, the impacts of the pandemic and the recovery thereafter affected all the provinces of Indonesia. During this period, there was an increasing distribution of Islamic Philanthropy, and it impacted the decrease in poverty; however, the provinces where the distribution of Islamic philanthropy increased the most were not the same provinces where poverty decreased the most. The same effect is expected for Cash Transfers.

It is important to make this distinction, as changes over time may be due to common shocks that affect the entire country. The absence of correlation between the distribution of Islamic philanthropy and the poverty rate of the province should not be interpreted as no improvement in the well-being of the *mustahik*. As noted in earlier studies, the design of the program, the selection of the *mustahik*, and the level

of engagement of the *amil* mentors significantly impact the well-being of the *mustahik* (Ayuniyyah et al., 2025; Herianingrum et al., 2023).

There are a few reasons that might justify this type of occurrence. First, the transfers are relatively small in comparison to the poverty levels in the provinces. Help likely only assists in meeting basic needs; it is unlikely to lift the recipients out of poverty. Furthermore, distributional data at the aggregate level does not tell us if the beneficiaries of the assistance are poor. While these reasons appear legitimate, they are not the mechanisms that this study is considering. Finally, the results are inconsistent with Choiriyah et al. (2020) , who found a reduction in poverty using the BAZNAS Welfare Index in 28 provinces in 2017-2018.

Islamic Philanthropy Distribution, the Poverty Rate, and Recorded Criminal Offenses

Once controlled for year effects, the results demonstrate no strong relationship between the distribution of Islamic philanthropy and recorded criminal offenses, nor between poverty and recorded criminal offenses. The nature of the dependent variable is important. Recorded criminal offenses are crimes reported to and registered by the police, and may not represent all crimes that occur. Reporting behaviors, and the capacity and attitude of the police in registering crimes may influence the observed levels. Levitt (1998) points out, changes in the police may influence the statistics reported, even if the level of criminal activity remains the same. The positive and weak philanthropy coefficient should not be read as increasing the level of crime. The insignificant relationship between the poverty rate and recorded criminal offenses may be because of differences in kinds of crime. Recent quasi-experimental studies indicate that crime may not always be in the same direction as the result of a change in income support. Emergency financial assistance reduced violent crime, but increased property crime (Palmer et al., 2019), while a Universal Basic Income reduced Property Crime and had no effect on Violent Crime (Watson et al., 2020). Because this research relies on aggregate levels of recorded criminal offenses, it is not possible to determine if particular offense categories may be related to provincial social and economic conditions

Islamic Philanthropy Distribution and Real GRDP

The positive relationship between Islamic philanthropy and real GRDP is the only relationship supported under all three inference methods. The rest of the relationships, including Cash Transfers and real GRDP, require further evidence to confirm. Transfers to lower-income households may stimulate local consumption through increased demand (Herianingrum et al., 2023). Meanwhile, productive empowerment programs may strengthen the economic activities of program recipients. The results are broadly in line with Ben Jedidia and Guerbouj (2021), who find a positive effect of *zakat* on economic growth in the dynamic panel of eight Muslim countries for the period 2004 to 2017. The estimated elasticity of 0.03 shows a rather weak effect: conditional on the model specification, a 1% increase in the distribution of Islamic philanthropy would increase the real GRDP by 0.03%. This doesn't mean philanthropy causes economic growth. Reverse causality is possible. More developed economies may be able to mobilize more philanthropic donations. Lastly, because the aggregate data don't distinguish between consumptive and productive donations, the reason for the positive association can't be fully clarified.

The Poverty Rate, Recorded Criminal Offenses, and Real GRDP

Established arguments are linked to (Ravallion, 2012), whereby initial periods of high poverty are associated with low consumption growth. Crime is argued to increase costs to victims and firms, and discourage investment (Detotto & Otranto, 2010; Raj & Kalluru, 2023). In this study, the estimated poverty coefficient is of the opposite sign and unstable, i.e., not significant, under wild cluster bootstrap. Therefore, it does not provide a reliable basis for substantive interpretation. This result is in line with the observation that the poverty-growth relationship is contextual and dependent on the local economy as well as the model being estimated. Zhu et al. (2022) find that the poverty-growth relationship is negatively correlated and becomes insignificant with the inclusion of employment conditions. In this study, the stability of the poverty coefficient, conditional on the inclusion of region and time fixed effects, indicates that the unemployment rate is acting as an inverse of poverty.

The relationship for recorded offenses is negative as expected. The result is consistent with Detotto and Otranto (2010) with Raj and Kalluru (2023). Stability of the coefficient is only attained through Driscoll-Kraay standard errors. Such sensitivity to the chosen approach of inference should be considered carefully in light of the limited time dimension of the panel. Moreover, several issues related to measurement should be taken into account when interpreting this correlation. Namely, the recorded criminal offenses include both offending per se and their registration (Levitt, 1998).

Additionally, there is evidence suggesting that the relationship could be bidirectional. For instance, Sugiharti et al. (2023) indicate a positive relationship between regional income and the level of recorded crimes in Indonesia. While this result cannot prove reverse causality in the current study, it shows the complexity of the relationship between the region's income and recorded criminal offenses since higher regional income may be accompanied by more, rather than fewer, recorded criminal offenses.

Based on the results, there is no support for a path connecting the distribution of Islamic philanthropy to higher real GRDP through reduced poverty and lower recorded criminal offenses. The link between philanthropy distribution and poverty rates is not statistically significant. Similarly, the relationship between poverty rates and recorded criminal offenses does not show significance in the models that include year fixed effects.

CONCLUSION

The findings show that the spread of philanthropy across provinces is linked to real GRDP, yet Islamic philanthropy does not consistently connect with poverty or with recorded criminal offenses. Only hypothesis H4 holds true across all three inference methods. When province and year effects are taken into account, Islamic philanthropy shows no strong link to poverty nor to recorded offenses, and poverty shows no link to recorded criminal offenses. Moreover, poverty and recorded criminal offenses do not have a connection with real GRDP. The relationships seen in models that ignore year effects may simply reflect trends instead of differences that are unique to each province. These results underline the need to separate the effects of Islamic philanthropy from its social effects.

Islamic philanthropy distribution is linked to real GRDP but that link does not automatically mean that poverty goes down or that crime reports drop. Hence, the

link between philanthropy and overall economic performance must be looked at apart from how Islamic philanthropy affects families. There is no data on the kinds of programs and the poverty status of those who get help, so deeper analysis is hard. BAZNAS and private *zakat* institutions need to record where money goes, which program type it goes to, the poverty level of the recipients, and the area it is used. Islamic philanthropy should work with public welfare programs by boosting coordination between government and *zakat* bodies and sharing data. Lastly, crime numbers should be read carefully because they can show how well reporting works and how strong law enforcement is, not real crime levels.

Future work should include detailed data on how Islamic philanthropy is distributed across different types of programs, the people who receive help, their poverty levels, and where they live. When we have data over periods and can compare it at the district or municipal level, we might uncover patterns that are not visible when looking only at province-level numbers. If victim surveys are available, they could help confirm the criminality data we are using. Also, if there are differences in factors that affect the variable we are studying, we can use instrumental-variable methods or quasi-experimental approaches to better understand cause and effect.

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