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EXAMINING THE IMPACT OF INVESTMENT, LABOR, AND ZAKAT ON ECONOMIC GROWTH IN INDONESIA: A PANEL DATA APPROACH

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Abstract

This study aims to analyze the effect of investment, labor, and zakat on economic growth in Indonesia during the period 2019–2024. The research employs a quantitative approach using panel data regression, combining time series and cross-sectional data from 33 provinces in Indonesia. The analytical models applied include the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), with the most appropriate model selected through the Chow test and Hausman test. The findings indicate that investment, labor, and zakat have a positive and significant effect on economic growth, both partially and simultaneously. Investment shows the largest contribution in increasing production capacity and stimulating regional economic activities. Labor plays an important role in improving productivity and economic output through both the quantity and quality of the workforce. Zakat, as an Islamic social finance instrument, contributes to increasing purchasing power, reducing income inequality, and promoting more inclusive economic growth. This study is limited by the relatively short observation period and the limited number of variables included in the model. Future research is recommended to incorporate additional variables such as education, technology, and financial inclusion to provide more comprehensive results. The practical implications suggest that the government should strengthen policies that support investment climate improvement, workforce development, and productive zakat management in order to achieve sustainable economic growth. The originality of this study lies in integrating conventional economic variables with Islamic economic instruments within a single empirical model to explain economic growth in a Muslim-majority developing country.

Keywords: investment, labor, zakat, economic growth, panel data

INTRODUCTION

Economic growth is one of the most crucial indicators used to evaluate a country's level of development and societal welfare. (Raihan & Tuspekova, 2022) It reflects not only the expansion of output and income but also the transformation in economic structure and the distribution of wealth. Economic growth refers to the long-term increase in a country's capacity

to provide an expanding range of goods and services to its population.(Surya et al., 2021) This increase must be sustained and inclusive to ensure equitable development and social stability. In developing countries like Indonesia, fostering sustainable and inclusive economic growth remains a central goal to reduce poverty, create jobs, and narrow the gap between regions.(Surya et al., 2021)

Indonesia's economic growth is commonly measured by the Gross Regional Domestic Product (GRDP), which represents the aggregate value of goods and services produced within each province over a specific period.(Rofik et al., 2025) GRDP serves as a proxy for regional economic performance and allows for comparative analysis across different provinces. Analyzing GRDP trends is instrumental in identifying disparities, designing localized development strategies, and promoting balanced economic growth. The GRDP data from 2019 to 2024 reveals substantial regional disparities and economic fluctuations that have been influenced by external shocks most notably the COVID-19 pandemic—and internal policy responses. The economic contraction in 2020 due to the pandemic was severe. Almost all provinces recorded a decline in GRDP, particularly those highly dependent on the tourism and informal sectors. For instance, DKI Jakarta's GRDP declined from IDR 2,815 trillion in 2019 to IDR 2,767 trillion in 2020, while Bali, a tourism-centric province, saw a sharper contraction from IDR 251.9 trillion to IDR 224.2 trillion. These declines underscore the vulnerability of regional economies to external disruptions. However, as health restrictions eased and stimulus policies took effect, the period of 2021 to 2024 showed signs of recovery. Provinces such as West Java experienced a significant GRDP rebound from IDR 2,208 trillion in 2021 to IDR 2,825 trillion in 2024. Despite this recovery, inter-provincial inequality in economic contribution remains prominent, with provinces on Java Island continuing to dominate, while Eastern Indonesia lags behind.

One of the fundamental determinants of economic growth is investment, particularly domestic investment.(Farosa et al., 2024) Investment serves as the engine of growth by expanding productive capacity, fostering industrial development, and creating employment opportunities.(Meiryani et al., 2023) During the 2019–2024 period, domestic investment in Indonesia exhibited significant fluctuations. The investment decline in 2020 was evident across

almost all provinces due to global uncertainty and weakened investor confidence. For example, DKI Jakarta's domestic investment dropped from IDR 62,094.8 billion in 2019 to IDR 42,954.7 billion in 2020. Despite the initial downturn, policy initiatives such as the Omnibus Law on Job Creation and fiscal incentives helped reinvigorate investment post-2021. By 2024, domestic investment in DKI Jakarta surged to IDR 128,402.1 billion, reflecting restored investor confidence and improving macroeconomic conditions. However, investment growth remains unequally distributed. Java Island, with its relatively better infrastructure and regulatory environment, continues to attract a disproportionately large share of investment, while provinces outside Java face structural challenges. Although investment is theoretically expected to contribute positively to growth through capital accumulation and productivity enhancement, its actual impact in Indonesia varies significantly by region due to these underlying disparities.(Guenther & Guenther, 2021)

In parallel with investment, labor force dynamics play a pivotal role in shaping economic outcomes. The quantity and quality of the workforce determine a nation's productive capacity. Between 2019 and 2024, Indonesia's working-age population (aged 15 years and older) showed a consistent upward trend, reaching 152.11 million in 2024, with 144.64 million employed.(Lyons et al., 2013) While the overall unemployment rate declined to 4.91% in 2024, structural issues in the labor market persist. A large proportion of the workforce remains engaged in the informal sector, particularly in agriculture, trade, and microenterprises. Informality reduces economic resilience, limits access to social protection, and lowers productivity. Despite ongoing efforts such as vocational training programs and labor market reforms under the Job Creation Law regional disparities in labor market conditions persist. Theories of economic growth such as the Solow-Swan model emphasize labor as a core input in production functions, where increases in both quantity and quality of labor enhance overall output.(Rofik et al., 2025) Moreover, the Lewis dual-sector model highlights the role of labor transition from traditional to modern sectors in accelerating economic growth. Thus, improving labor quality through education, upskilling, and better employment conditions is essential for sustainable growth.

Beyond conventional macroeconomic factors, Islamic economic instruments—notably zakat offer alternative mechanisms for fostering inclusive economic development. Zakat serves as a redistributive tool mandated in Islamic law, whereby wealth is transferred from the affluent (muzakki) to the poor and underprivileged (mustahiq). Between 2019 and 2024, zakat, infak, and sedekah (ZIS) collection in Indonesia increased markedly, from IDR 14.1 trillion in 2021 to IDR 26.13 trillion by mid-2024. This growth illustrates both the rising awareness and potential of zakat as a complementary fiscal instrument. Despite its growth, zakat management faces institutional fragmentation and underutilization in many provinces. From a theoretical standpoint, zakat contributes to economic growth by alleviating poverty, enhancing aggregate demand, and improving social cohesion. Zakat functions as an Islamic fiscal instrument that supports consumption-led growth while simultaneously promoting social justice.(Lutfi, 2023)

Given the varying regional contexts and institutional capacities, a nuanced understanding of the interaction between investment, labor, and zakat is necessary to fully grasp their impact on economic growth in Indonesia. While previous studies have examined these variables independently, there is a lack of comprehensive empirical analysis that considers their combined effects using robust econometric techniques across regions and over time. To address this gap, the present study employs a panel data regression approach using provincial-level data from 33 provinces in Indonesia spanning 2019–2024. This methodological approach enables the identification of fixed or random effects that account for unobserved heterogeneity among provinces, offering a deeper understanding of how investment, labor, and zakat collectively influence regional economic performance. Thus, this research, titled "An Analysis of the Relationship Between Investment, Labor, and Zakat with Economic Growth in Indonesia Using Panel Data", aims to generate empirically grounded insights and actionable policy recommendations. By examining the interconnected roles of financial capital (investment), human capital (labor), and social capital (zakat), the study contributes to the broader discourse on inclusive and sustainable economic development in Indonesia.(Lutfi, 2023) It also offers a novel perspective by integrating Islamic fiscal tools into mainstream economic analysis, reflecting the unique socioeconomic and cultural context of Indonesia as the world's largest Muslim-majority nation.

LITERATURE REVIEW

Recent studies by (Suryono, J., 2023) demonstrate that while Fixed Capital Formation remains a bedrock of GDP growth, the quality of investment specifically in digital infrastructure and green energy now yields a higher multiplier effect than traditional extractive industries. This evolution in investment patterns reflects a strategic pivot in Indonesia's national policy, moving beyond mere capital accumulation toward a "quality-growth" paradigm that emphasizes technological absorption and sustainable industrialization.

In the realm of labor dynamics, the period between 2022 and 2026 has seen a critical re-evaluation of the "demographic dividend." (Pratiwi, R., & Setiawan, 2024) argue that labor quantity no longer guarantees growth; instead, the focus has shifted to the "skills-mismatch" phenomenon within the Indonesian job market. Their panel data findings suggest that regional economic growth is more sensitive to the presence of a digitally literate workforce than to total labor force participation. This highlights a transition where human capital is viewed not just as a production input, but as an endogenous driver of innovation that determines how effectively a province can utilize its allocated investment.

A significant breakthrough in recent literature is the empirical validation of Zakat as a formal macroeconomic stabilizer. Research by (Nurul Huda et al., 2023) utilizes advanced panel vector error correction models to show that Zakat collection has a significant long-term positive correlation with household consumption levels across Indonesian provinces. Unlike the earlier view of Zakat as purely philanthropic, contemporary scholars now categorize it as an "automatic stabilizer" that supports aggregate demand during periods of high inflation or economic contraction, providing a unique religious-fiscal cushion that complements government social spending.

The synergy between Islamic social finance and productive investment has also gained scholarly traction. (Fauzi, A., & Siregar, 2025) observe that the transformation of Zakat from "consumptive aid" to "productive capital" (through micro-financing for SMEs) has effectively bridged the financing gap for unbanked populations. Their study indicates that when Zakat is integrated into local economic ecosystems, it reduces the Gini coefficient and enhances the

productivity of the informal sector. This creates a bottom-up growth trajectory that stabilizes the national economy by strengthening its most vulnerable segments.

From a methodological standpoint, the use of Panel Data Analysis in the last five years has become more sophisticated, incorporating spatial dependencies to account for the "spillover effects" between neighboring provinces. (Santoso, 2021) asserts that a standard Fixed Effects model often overlooks the geographical interconnectedness of Indonesia's economy. Recent literature suggests that investment in a major hub like Jakarta or Surabaya significantly influences the labor mobility and economic output of surrounding regions, necessitating a more nuanced spatial-panel approach to accurately capture the impact of fiscal and social variables on national development.

Finally, the most recent academic consensus suggests that Indonesia's path to becoming a top-tier global economy depends on a "Triple-Helix" of growth: robust investment, a high-skilled labor force, and the optimization of Islamic social instruments. (Widiastoeti, H., 2024) conclude that the simultaneous impact of these three variables creates a more resilient economic structure against global volatility. This integrated framework not only addresses the material requirements of growth but also fulfills the distributive justice mandates inherent in Indonesia's socio-economic identity, positioning Zakat as a modern tool of public finance within a globalized market.

Table 1. Conceptual Framework

Variable	Core Concept	Key Indicators	Literature Findings	Implications for Economic Growth
Investment (Fixed Capital Formation)	A shift from quantity investment to quality investment	the Digital of infrastructure to the investment of energy, industrial upgrading	Suryono (2023) finds that technology-based and green energy investments generate higher multiplier effects compared to extractive industries	Promotes sustainable economic growth and enhances national productivity
Labor	Transformation from labor quantity to human capital quality	Digital literacy, skill level, regional workforce adaptability	Pratiwi & Setiawan (2024) show that regional economic growth is more sensitive to literate workers than investment	Labor becomes a driver of innovation and improves the efficiency of investment

Variable	Core Concept	Key Indicators	Literature Findings	Implications for Economic Growth
Zakat	Zakat as a socio-fiscal instrument and macroeconomic stabilizer	Household consumption, income redistribution, social safety net	to total labor force utilization size Nurul Huda et al. (2023) demonstrate a significant long-term positive relationship between zakat collection and household consumption	Maintains aggregate demand stability and mitigates the effects of economic contraction
Productive Zakat	Transformation of zakat from consumptive into productive capital	Transformation of SME financing from reduction of aid income inequality to productive informal productivity	Fauzi & Siregar (2025) find that zakat reduces the Gini coefficient and improves informal sector productivity	Strengthens grassroots economic capacity and promotes inclusive growth
Spatial Economic Linkages	Economic interconnectivity across regions (spillover effects)	Labor mobility, regional connectivity, inter-provincial growth dynamics	Santoso (2021) shows that investment in major economic hubs affects surrounding regions	Economic growth is spatially integrated across provinces
Triple-Helix Growth Model	Synergy between investment, labor, and zakat	Integration of economic policy and Islamic finance instruments	Widiastoeti (2024) concludes that the interaction of these three variables enhances economic resilience to volatility	Creates a stable, inclusive, and equitable economic structure

Source: Adapted from Suryono (2023); Pratiwi & Setiawan (2024); Nurul Huda et al. (2023); Fauzi & Siregar (2025); Santoso (2021); Widiastoeti (2024).

METHOD

The study adopts a quantitative, causal-comparative research design to examine the relationship between key variables and economic growth in Indonesia. (Hossan et al., 2023) The quantitative approach is chosen to allow for rigorous hypothesis testing using numerical data

and statistical analysis.(Kotronoulas et al., 2023) The causal-comparative design is appropriate because it observes existing variations in variables across provinces and time, without any experimental manipulation, to identify potential causal links. The research uses a panel data approach, which combines both time-series and cross-sectional data from 33 Indonesian provinces over a six-year period, from 2019 to 2024. This method is particularly useful as it offers more data points for a more robust analysis, leading to more efficient and reliable estimations by accounting for unobserved differences between provinces.(Ghanad, 2023)

The research defines its variables and identifies their data sources to ensure the study's reliability. The dependent variable is economic growth, which is measured by each province's Gross Regional Domestic Product (GRDP) at constant prices, a standard indicator of regional economic performance. The study's three independent variables are investment, labor force, and zakat. Investment is quantified by the amount of realized domestic investment, representing capital accumulation. The labor force is measured by the number of people in the workforce, reflecting human capital input. Zakat is measured by the total amount of ZIS (zakat, infak, and sedekah) collected and distributed, serving as a proxy for Islamic social financing. All data are sourced from credible national institutions, including the Central Statistics Agency (BPS), the Investment Coordinating Board (BKPM), the Ministry of Manpower, and the National Zakat Agency (BAZNAS).(Munir & Abdullah, 2022)

To analyze the data, the study uses panel regression analysis. The general model is structured to show how economic growth (Y) is influenced by investment (X_1), labor force (X_2), and zakat (X_3). (Ghanad, 2023) The study will systematically determine the best-fit model by comparing three common models: the Common Effects Model, the Fixed Effects Model (FEM), and the Random Effects Model (REM). This process involves a series of diagnostic tests. The Chow test is used to decide between the Common Effects and Fixed Effects models, while the Hausman test determines if the Fixed Effects or Random Effects model is more appropriate. Prior to these steps, the research will also perform classical assumption tests to validate the model, checking for normality of residuals, multicollinearity, autocorrelation, and heteroskedasticity.

The study aims to test four main hypotheses using the t-test, F-test, and R^2 (coefficient of determination). The t-test will evaluate the individual significance of each independent variable (investment, labor, and zakat) on economic growth. The F-test will assess whether all three variables jointly have a significant effect. The R^2 will show the model's overall explanatory power. These hypotheses are supported by established economic theories: investment is a key driver of growth (endogenous growth theory), labor is a fundamental production input (Solow-Swan model), and zakat promotes inclusive growth by stimulating demand and redistributing wealth (Islamic economic principles). The research aims to use this comprehensive methodology to provide empirical evidence for how these conventional and Islamic factors influence Indonesia's regional economic landscape.

RESULT

Economic Growth in Indonesia

Economic growth in Indonesia during the period 2019–2024 demonstrates a generally increasing trend across most provinces, although variations in growth magnitude are still evident. Economic growth is commonly reflected in the Gross Regional Domestic Product (GRDP), which measures the total value of goods and services produced within a region. GRDP provides a quantitative indicator to evaluate regional economic performance and structural transformation over time (Ghanad, 2023). As a developing country, Indonesia faces the challenge of achieving stable and equitable growth across regions, considering differences in natural resources, human capital, infrastructure, and institutional capacity. These disparities influence the ability of each province to generate output and respond to external shocks, including the COVID-19 pandemic and global economic uncertainty.

Table 2. Economic Growth in Indonesia Based on Gross Regional Domestic Product at Current Prices, 2019–2024

No	Province	2019	2020	2021	2022	2023	2024
1	Aceh	164163	166372.3	184979.9	209698.4	227018.2	243202.1
2	Sumatera Utara	799609	811188.3	859934.3	955193.1	1050995	1146920
3	Sumatera Barat	245949.7	241894.1	253100.2	285375.4	312769.4	332936.4
4	Riau	760247.5	727599.5	839002.4	991615.4	1026472	1112482

No	Province	2019	2020	2021	2022	2023	2024
5	Jambi	216927.7	205082	232294.2	276936.9	293780	322975.5
6	Sumatera Selatan	453402.7	454607.4	493636.9	590079.4	629168.7	663961.7
7	Bengkulu	72098.24	73305.27	79602.64	90111.95	96583.09	103991.9
8	Lampung	356676.8	353025.1	371198.9	414119.7	448850.6	483882.9
9	Kep. Bangka Belitung	75794.96	75519.77	85961.29	95286.44	102526.8	107504.8
10	Kep. Riau	267631.5	254095.4	275622.9	308739.7	331644.5	352436.4
11	DKI Jakarta	2815636	2767273	2912885	3188541	3443026	3679359
12	Jawa Barat	2123154	2082107	2204660	2422782	2625226	2823339
13	Jawa Tengah	1360960	1347222	1419735	1559140	1695622	1817777
14	DI Yogyakarta	141047.7	138117.8	149413.7	165724.5	180696	193514.6
15	Jawa Timur	2345549	2299808	2454792	2731424	2953547	3168296
16	Banten	661321.3	625895.4	665870.3	747220.8	814122	873626.3
17	Bali	251934.1	224225.7	220466.4	245367.9	274358.2	298441.5
18	Nusa Tenggara Barat	132500.1	133613.7	140115.3	156942.7	166395.5	182265.2
19	Kalimantan Barat	212150.3	213950.4	231321.2	255797.3	274468.6	300166.9
20	Kalimantan Tengah	150046.1	152187.4	169655.9	199741.3	208783.4	222864.5
21	Kalimantan Selatan	180557.6	179162	197882.4	251098.7	269192	286818.9
22	Kalimantan Timur	652480.3	607744.5	696632.7	921451	843571.3	858430.7
23	Kalimantan Utara	96509.93	100423.2	111530.2	138675	147278.6	146793.5
24	Sulawesi Utara	130126.5	132230.1	142620.4	157039.5	171969.4	187374.3
25	Sulawesi Tengah	185740.1	197440.8	247280.4	323630.3	347139	376950.3
26	Sulawesi Selatan	504320.7	504052.5	544857.1	605175.9	652648.1	696252.8
27	Sulawesi Tenggara	129225.2	130107.3	139476.8	158800.3	176179.9	189481.8
28	Gorontalo	41145.45	41729.89	43893.26	47566.29	51366.74	54554.5
29	Sulawesi Barat	46365.79	46465.91	50565.53	54028.35	58572.05	64214.88
30	Maluku	46152.82	46263.47	48893.68	54078.63	58487.79	62646.24
31	Maluku Utara	39695.49	42298.87	52480.52	70902.61	85143.13	95787.67
32	Papua Barat	84356.97	83588.64	85078.49	91302.02	61576.37	76177.48
33	Papua	189510.7	199186.6	235487.5	262519.8	81731.73	85914.33

Source: Statistics Indonesia (BPS), 2025

Based on Table 2, most provinces experienced positive GRDP growth between 2019 and 2024, although several provinces experienced temporary contractions during the pandemic period. Provinces located on Java Island, such as DKI Jakarta, West Java, Central Java, and East Java, consistently recorded the highest GRDP values, indicating the concentration of economic activity in industrial and service sectors. These findings reflect structural differences in regional economic capacity, which are influenced by financial development, institutional support, and access to productive resources (Masdupi et al., 2024). Meanwhile, provinces in Eastern Indonesia generally show smaller GRDP values but maintain gradual growth trends, indicating potential for further economic development.

Table 3. Economic Growth Based on GRDP at Current Prices and Key Growth-Driving Sectors (2019–2024)

No	Province	2019	2024	Key Growth-Driving Sectors
1	Aceh	164,162.98	243,202.09	Agriculture, wholesale trade, mining
2	North Sumatera	799,609	1,146,920	Agriculture, manufacturing, trade, services
3	West Sumatera	245,949.7	332,936.4	Agriculture, fisheries, manufacturing
4	Riau	760,247.5	1,112,482	Oil & gas, plantations, manufacturing
5	Jambi	216,927.7	322,975.5	Agriculture, mining, manufacturing
6	South Sumatera	453,402.7	663,961.7	Agriculture, mining, trade
7	Bengkulu	72,098.24	103,991.9	Agriculture, trade, logistics
8	Lampung	356,676.8	483,882.9	Agriculture, manufacturing, services
9	Bangka Belitung	75,794.96	107,504.8	Tin mining, trade
10	Riau Islands	267,631.5	352,436.4	Manufacturing, services
11	DKI Jakarta	2,815,636	3,679,359	Services, finance, trade
12	West Java	2,123,154	2,823,339	Manufacturing, construction
13	Central Java	1,360,960	1,817,777	Manufacturing, agriculture
14	DI Yogyakarta	141,047.7	193,514.6	Tourism, education
15	East Java	2,345,549	3,168,296	Manufacturing, trade
16	Banten	661,321.3	873,626.3	Manufacturing, construction
17	Bali	251,934.1	298,441.5	Tourism, services
18	NTB	132,500.1	182,265.2	Tourism, agriculture
19	West Kalimantan	212,150.3	300,166.9	Agriculture, trade
20	Central Kalimantan	150,046.1	222,864.5	Agriculture, construction
21	South Kalimantan	180,557.6	286,818.9	Mining, agriculture

No	Province	2019	2024	Key Growth-Driving Sectors
22	East Kalimantan	652,480.3	858,430.7	Mining, industry
23	North Kalimantan	96,509.93	146,793.5	Oil & gas processing
24	North Sulawesi	130,126.5	187,374.3	Agriculture, trade
25	Central Sulawesi	185,740.1	376,950.3	Manufacturing, mining
26	South Sulawesi	504,320.7	696,252.8	Trade, agriculture
27	Southeast Sulawesi	129,225.2	189,481.8	Agriculture, services
28	Gorontalo	41,145.45	54,554.5	Fisheries, trade
29	West Sulawesi	46,365.79	64,214.88	Household consumption
30	Maluku	46,152.82	62,646.24	Fisheries, trade
31	North Maluku	39,695.49	95,787.67	Mining, fisheries
32	West Papua	84,356.97	76,177.48	Agriculture (contraction)
33	Papua	189,510.7	85,914.33	Commodity price fluctuation

Source: Statistics Indonesia (BPS), 2025

Table 3 indicates that economic growth across provinces is supported by diverse leading sectors, including agriculture, manufacturing, mining, trade, and services. Provinces with strong industrial bases tend to exhibit higher GRDP values, while regions dependent on primary sectors demonstrate moderate but stable growth patterns. The variation in sectoral contributions highlights structural differences in regional economic composition and resilience to external shocks. Financial inclusion, access to capital, and institutional support have been shown to influence business productivity and regional competitiveness (Masdupi et al., 2024). Additionally, Islamic economic instruments such as zakat have been recognized as complementary mechanisms that may enhance social welfare and reduce inequality through productive distribution strategies (Munir & Abdullah, 2022). However, challenges related to financial system development and institutional capacity remain important considerations in understanding regional economic disparities (Iswanaji, 2018).

Investment in Indonesia

Investment represents the allocation of financial resources into productive assets with the expectation of generating future returns or increasing value. Investment plays an important role in promoting capital accumulation, supporting infrastructure development, and increasing productivity across economic sectors. In macroeconomic analysis, domestic investment is often

associated with economic expansion because it strengthens production capacity and stimulates business activities (Ghanad, 2023). Investment activity is also influenced by institutional quality, regulatory frameworks, and financial system development, which determine the level of investor confidence (Iswanaji, 2018). In Indonesia, domestic investment (Penanaman Modal Dalam Negeri – PMDN) is an important indicator reflecting the level of economic activity and the effectiveness of government policies in improving the investment climate (Endaryono & Djuhartono, 2024).

Table 4. Domestic Investment (PMDN) Realization 2019–2024 by Province (Million IDR)

No	Province	2019	2024	Key Factors & Driving Sectors
1	Aceh	3606.9	8317	Ease of doing business, infrastructure development
2	Sumatera Utara	19749	22445.7	Agriculture, manufacturing, trade, tourism
3	Sumatera Barat	3026.6	7956.3	Construction and property sector
4	Riau	26292.2	61097.6	Oil & gas, plantations, manufacturing
5	Jambi	4437.4	9986.2	Agriculture, manufacturing
6	Sumatera Selatan	16921.1	36671.4	Mining, manufacturing
7	Bengkulu	5458.1	7982.5	Agriculture, tourism
8	Lampung	2428.9	7218.1	Agriculture, trade
9	Kep. Bangka Belitung	2915.2	15724.8	Mining, trade
10	Kep. Riau	5656.4	10017.4	Manufacturing, services
11	DKI Jakarta	62094.8	128402.1	Transportation, telecommunications
12	Jawa Barat	49284.2	101552.1	Manufacturing, services
13	Jawa Tengah	18654.7	33298.7	Manufacturing, trade
14	DI Yogyakarta	6298.8	3630.3	Policy changes, macroeconomic challenges
15	Jawa Timur	45452.7	92410.1	Transportation, warehousing
16	Banten	20708.4	47605.8	Manufacturing, logistics
17	Bali	7393.2	12312.3	Tourism, services
18	Nusa Tenggara Barat	3519	43385	Tourism, plantations
19	Kalimantan Barat	7699.1	15416.1	Mining, trade
20	Kalimantan Tengah	8591.9	15229.3	Agriculture, plantations
21	Kalimantan Selatan	10061	16579.3	Mining, manufacturing
22	Kalimantan Timur	21952	55078.9	Chemicals, mining

No	Province	2019	2024	Key Factors & Driving Sectors
23	Kalimantan Utara	4400.9	11924.5	Oil & gas processing
24	Sulawesi Utara	8259.6	5783.9	Regional economic dynamics
25	Sulawesi Tengah	4438.8	4593	Strategic sectors
26	Sulawesi Selatan	5672.6	8412	Agriculture, construction
27	Sulawesi Tenggara	3827.1	5517.3	Infrastructure development
28	Gorontalo	844.4	4003.9	Domestic investment promotion
29	Sulawesi Barat	1187.2	2893	Agriculture revitalization
30	Maluku	283.2	1569.5	Infrastructure development
31	Maluku Utara	682.7	9134.8	Mining, manufacturing
32	Papua Barat	380.2	1377.9	Licensing reform
33	Papua	567.7	974.8	Infrastructure development

Source: Statistics Indonesia (BPS), 2025

Table 4 shows that the realization of domestic investment increased in most provinces during the 2019–2024 period, although the magnitude of growth varies considerably across regions. Provinces located on Java Island, such as DKI Jakarta, West Java, East Java, and Banten, recorded the highest domestic investment values, reflecting strong industrial concentration, infrastructure availability, and market accessibility. In contrast, provinces in Eastern Indonesia show relatively smaller investment values but demonstrate gradual increases, indicating improving regional investment attractiveness. Investment growth is closely associated with regulatory reforms, simplified licensing procedures, and infrastructure development programs aimed at strengthening national competitiveness (Iswanaji, 2018).

The results also indicate that government policies focusing on improving the business climate contribute to increased domestic investment realization. Fiscal decentralization and regional autonomy policies encourage local governments to actively promote regional economic potential and facilitate investment activities. In addition, demographic factors, including workforce availability and productivity improvements, provide important support for investment expansion (Masdupi et al., 2024). Previous studies also emphasize that productive investment contributes to sustainable economic development by supporting industrial growth and increasing value-added production (Munir & Abdullah, 2022). Overall, the results demonstrate that domestic investment plays an important role in supporting regional economic

performance and strengthening economic resilience across Indonesian provinces.

Labor in Indonesia

Labor represents one of the primary production factors contributing to economic growth. According to Statistics Indonesia (BPS), the labor force consists of individuals who are able to work in order to produce goods and services for economic activities. Labor availability reflects the productive capacity of a region and indicates the extent to which economic sectors can absorb workers. The size of the labor force is closely associated with employment opportunities, workforce productivity, and national development outcomes (Guguraty et al., 2025). Labor dynamics are also influenced by education levels, skill development, and institutional support systems that improve workforce competitiveness (Masdupi et al., 2024).

Table 5. Labor in Indonesia 2019–2024

No	Province	2019	2024
1	Aceh	726,921	2,508,354
2	North Sumatra	3,540,882	7,723,364
3	West Sumatra	1,136,607	2,924,753
4	Riau	1,191,409	3,159,367
5	Jambi	562,669	1,833,267
6	South Sumatra	1,369,064	4,480,100
7	Bengkulu	320,117	1,101,234
8	Lampung	1,210,632	4,787,589
9	Bangka Belitung	387,620	766,084
10	Riau Islands	846,792	1,049,087
11	DKI Jakarta	4,836,977	5,107,775
12	West Java	16,740,172	24,417,110
13	Central Java	8,782,789	20,861,393
14	DI Yogyakarta	1,515,432	2,182,769
15	East Java	10,775,574	23,361,110
16	Banten	4,038,288	5,797,923
17	Bali	1,635,806	2,665,421
18	West Nusa Tenggara	1,134,876	3,105,549
19	West Kalimantan	758,715	2,863,521
20	Central Kalimantan	534,201	1,402,275

No	Province	2019	2024
21	South Kalimantan	916,585	2,129,276
22	East Kalimantan	1,146,111	1,976,447
23	North Kalimantan	199,202	378,361
24	North Sulawesi	580,653	1,305,834
25	Central Sulawesi	423,940	1,598,656
26	South Sulawesi	1,578,792	4,680,928
27	Southeast Sulawesi	414,937	1,430,889
28	Gorontalo	235,634	632,184
29	West Sulawesi	128,030	757,507
30	Maluku	1,297,329	907,713
31	North Maluku	141,279	661,488
32	West Papua	164,992	290,077
33	Papua	419,017	458,792

Source: Statistics Indonesia (BPS), 2025

Zakat in Indonesia

Zakat is an Islamic social finance instrument that plays an important role in supporting social welfare and reducing economic inequality. Zakat contributes to income redistribution by transferring wealth from higher-income groups to economically vulnerable populations. In addition to its religious function, zakat has economic implications, particularly in supporting consumption, poverty alleviation, and community empowerment (Munir & Abdullah, 2022). The development of zakat management institutions has improved the effectiveness of zakat distribution, allowing it to support productive economic activities and social assistance programs (Chaerunnisa et al., 2025).

Table 6. Zakat, Infak, Sedekah, and Other Religious Social Funds (ZIS-DSKL)

Distribution in Indonesia (Billion IDR)

No	Province	2019 (Billion IDR)	2024 (Billion IDR)	Note
1	Aceh	295.88	274.25	Decrease
2	North Sumatra	33.26	119.58	Significant increase
3	West Sumatra	128.07	261.67	Significant increase

No	Province	2019 (Billion IDR)	2024 (Billion IDR)	Note
4	Riau	90.19	289.07	Significant increase
5	Jambi	37.96	102.41	Significant increase
6	South Sumatra	35.91	74.60	Significant increase
7	Bengkulu	13.53	23.88	Significant increase
8	Lampung	10.35	53.92	Significant increase
9	Bangka Belitung Islands	23.98	19.54	Decrease
10	Riau Islands	38.78	67.26	Significant increase
11	DKI Jakarta	2,065.01	504.93	Decrease
12	West Java	1,374.92	916.97	Decrease
13	Central Java	244.46	653.19	Significant increase
14	DI Yogyakarta	31.56	106.66	Significant increase
15	East Java	463.21	650.10	Significant increase
16	Banten	171.20	250.28	Significant increase
17	Bali	7.44	35.02	Significant increase
18	West Nusa Tenggara	95.37	215.76	Significant increase
19	West Kalimantan	10.30	23.61	Significant increase
20	Central Kalimantan	4.15	4.29	Stable
21	South Kalimantan	27.64	82.73	Significant increase
22	East Kalimantan	51.12	110.67	Significant increase
23	North Kalimantan	12.67	37.74	Significant increase
24	North Sulawesi	13.52	4.80	Decrease
25	Central Sulawesi	5.42	13.71	Significant increase
26	South Sulawesi	147.33	182.89	Significant increase
27	Southeast Sulawesi	12.53	51.97	Significant increase
28	Gorontalo	26.17	40.48	Significant increase
29	West Sulawesi	11.38	19.98	Increase
30	Maluku	4.37	5.17	Increase
31	North Maluku	7.61	7.64	Stable
32	West Papua	6.84	2.60	Decrease
33	Papua	8.77	21.33	Significant increase

Source: Statistics Indonesia (BPS), 2025

Table 6 indicates that zakat collection and distribution increased in most provinces between 2019 and 2024, although several provinces experienced fluctuations. Provinces with larger Muslim populations, such as West Java, East Java, and Central Java, recorded higher

zakat distribution values. The increase in zakat collection reflects improved institutional capacity and public awareness regarding zakat obligations. Zakat distribution also contributes to social welfare programs and productive economic activities, particularly for micro and small enterprises (Munir & Abdullah, 2022). These results indicate that zakat has potential as a complementary economic instrument to support inclusive development and reduce inequality (Chaerunnisa et al., 2025).

Panel Data Regression Results

Panel regression analysis was conducted to examine the influence of investment, labor, and zakat on economic growth in Indonesia during 2019–2024. Model selection tests indicate that the Fixed Effect Model (FEM) is the most appropriate specification.

Model Specification Tests

The Chow test shows a probability value of 0.0000, indicating that the Fixed Effect Model is preferred over the Common Effect Model. The Hausman test also produces a probability value of 0.0000, confirming that the Fixed Effect Model is more appropriate than the Random Effect Model. Therefore, the Fixed Effect Model is selected as the final estimation model.

Classical Assumption Tests

All classical assumption tests indicate that the regression model satisfies statistical requirements. The normality test produces a Jarque-Bera probability value of 0.064956 (>0.05), indicating normally distributed residuals. Multicollinearity test results show that all Variance Inflation Factor (VIF) values are below 10, indicating no multicollinearity problems. The Durbin-Watson statistic value of 1.739118 indicates no autocorrelation. The heteroskedasticity test produces a probability value of 0.1882 (>0.05), confirming homoscedastic residual variance. These results indicate that the model meets the statistical assumptions required for panel regression analysis (Ghanad, 2023).

Hypothesis Testing Results

The coefficient of determination (Adjusted R^2) value of 0.995794 indicates that 99.57% of the variation in economic growth can be explained by investment, labor, and zakat variables.

The remaining 0.43% is influenced by other variables not included in the model.

The partial test (t-test) results indicate that all independent variables significantly influence economic growth. Investment shows a positive and significant effect on economic growth (p-value $0.0000 < 0.05$). Labor also has a positive and significant effect (p-value $0.0000 < 0.05$). Zakat shows a positive and significant effect on economic growth (p-value $0.0340 < 0.05$). The simultaneous test (F-test) produces a probability value of 0.000000 (< 0.05), indicating that investment, labor, and zakat jointly influence economic growth.

Overall, the panel regression results indicate that investment, labor, and zakat significantly contribute to economic growth across Indonesian provinces. These findings demonstrate that economic growth is influenced not only by capital accumulation and labor productivity but also by social finance instruments that support income distribution and economic inclusion (Iswanaji, 2018; Munir & Abdullah, 2022).

DISCUSS

The Role of Investment in Economic Growth

The findings of this study indicate that investment has a positive and significant effect on economic growth in Indonesia during the 2019–2024 period. The regression results show that investment has a statistically significant coefficient, indicating that increased capital accumulation contributes directly to higher economic output. This finding confirms the theoretical assumption that investment plays a crucial role in expanding production capacity, encouraging technological adoption, and improving infrastructure development. According to the Harrod-Domar growth model, investment is considered a key driver of economic growth because it increases capital stock, which enhances productivity and output expansion (Jhingan, 2014). The empirical results of this study therefore reinforce the argument that capital formation remains an important determinant of economic performance, particularly in developing economies.

The findings are consistent with previous empirical studies showing that both domestic and foreign investment significantly influence economic growth. Mubarak and Sukmawati (2025) demonstrate that investment contributes positively to Gross Domestic Product (GDP)

growth through increased productive capacity and employment opportunities. Similarly, Apriliansah (2024) confirms that investment expansion strengthens aggregate demand and stimulates industrial development. Regional studies conducted by Purba (2020) and Choirunnisa and Khoirudin (2024) also reveal that investment positively affects regional economic growth in Indonesia, particularly in provinces with strong industrial structures. Evidence from international studies further supports these results. Li and Zhou (2023) and Nguyen et al. (2024) show that investment contributes to productivity growth and innovation capacity in East Asian and ASEAN countries. Differences in investment performance across provinces in this study may be explained by variations in infrastructure availability, regulatory quality, and market accessibility.

From a theoretical perspective, this study contributes to the development of endogenous growth theory by providing empirical evidence that investment not only increases output but also improves long-term productive capacity. In the Indonesian context, government initiatives such as regulatory reform, infrastructure expansion, and investment incentives have created a more conducive environment for business development. Policies such as the Job Creation Law and MSME empowerment programs have strengthened investment realization across provinces. These findings suggest that policy support plays an important role in ensuring that investment contributes effectively to sustainable economic growth.

In addition to conventional investment, Sharia-compliant investment instruments also demonstrate potential in supporting inclusive economic development. Islamic financial instruments such as sukuk, Sharia stocks, and Sharia mutual funds contribute to capital mobilization while maintaining ethical investment principles. Saputri and Hamidi (2025) find that Sharia stocks and sukuk have a positive and significant impact on economic growth, although the effect of Sharia mutual funds tends to be relatively smaller. Susi, Kurniawan, and Ahmad (2025) further highlight that Sharia investment contributes to financial inclusion and increases access to productive financing. Long-term analysis conducted by Sari and Pebruary (2025) indicates that Sharia investment has a significant long-term influence on economic growth, although short-term effects may vary. The development of Sharia capital markets therefore represents an important complementary strategy for strengthening economic

resilience and supporting equitable development (Marfutanti, 2021).

From a practical perspective, the findings suggest that policymakers should continue to improve investment facilitation through regulatory simplification, infrastructure provision, and institutional strengthening. Encouraging both conventional and Sharia investment may enhance capital accumulation and promote inclusive growth, particularly in provinces with lower investment realization.

The Role of Labor in Economic Growth

The empirical results show that labor has a positive and significant influence on economic growth in Indonesia. The regression results indicate that increases in labor force participation contribute to higher economic output, supporting classical economic growth theory, which emphasizes labor as a fundamental factor of production (Todaro, 2006; Mankiw, 2015). The Solow-Swan growth model also suggests that increases in labor supply contribute to output growth, particularly when accompanied by technological progress and human capital development.

These findings are consistent with previous empirical studies demonstrating a positive relationship between labor and economic performance. Silangit et al. (2025) find that employment growth significantly contributes to GRDP expansion across Indonesian provinces. Wijaya and Prasetyo (2023) also show that workforce participation positively affects economic expansion, particularly when labor is absorbed into productive sectors. Studies by Zhang and Lee (2023) and Chen et al. (2024) confirm that labor productivity improvements significantly influence economic growth in East Asian countries. Differences in labor productivity across regions may be explained by disparities in education, training opportunities, and access to formal employment.

This study contributes to human capital theory by demonstrating that labor quantity remains an important determinant of economic growth, particularly in developing countries with demographic advantages. However, the results also indicate that labor quality plays an important role in determining productivity levels. Studies by Sutrisna (2015) and Nasution et al. (2022) emphasize that labor force expansion must be accompanied by job creation to

prevent unemployment and underemployment. Government programs such as vocational training and workforce development initiatives are therefore essential for improving labor productivity.

From an Islamic economic perspective, labor is considered an important element in achieving social justice and economic balance. Rudianto (2024) finds that productive labor contributes significantly to regional economic growth within the framework of Sharia economic principles. The Indonesian Sharia Economic Masterplan 2019–2024 also highlights human capital development as a strategic priority in strengthening the Islamic economic ecosystem. Therefore, improving workforce quality through education, training, and formal employment opportunities represents an important policy implication derived from this study.

The Role of Zakat in Economic Growth

The results indicate that zakat has a positive and significant effect on economic growth, although the magnitude of the coefficient is relatively smaller compared to investment and labor variables. This finding supports the theory of the zakat multiplier effect, which suggests that zakat distribution increases consumption capacity among mustahiq (zakat recipients), thereby stimulating demand and encouraging production growth (Hardana & Rasyid, 2023). Zakat contributes to poverty reduction, income redistribution, and social welfare improvement, which collectively support inclusive economic development.

Empirical studies support these findings. Fauzan and Wibowo (2024) show that zakat distribution increases purchasing power and contributes to national economic growth. Najla, Setiawan, and Nugroho (2023) find that productive zakat distribution improves economic performance through increased consumption and small business development. Syamsuddin (2021) also highlights the multiplier effect of zakat as an important mechanism for stimulating economic growth. International evidence from Badiei and Zhu (2020) and Ishak et al. (2022) confirms that Islamic social finance instruments can complement fiscal policy by supporting income distribution and encouraging economic participation.

The findings of this study extend Islamic economic theory by empirically demonstrating that zakat contributes not only to social welfare but also to macroeconomic

performance. The integration of zakat into economic policy frameworks may enhance financial inclusion and strengthen economic resilience, particularly among low-income populations. The Indonesian Sharia Economic Masterplan 2019–2024 positions zakat as an important instrument for strengthening the real sector and supporting micro and small enterprises.

From a practical perspective, improving zakat collection efficiency, transparency, and institutional coordination may increase the contribution of zakat to economic growth. Strengthening collaboration between zakat institutions and government agencies may also enhance the effectiveness of zakat distribution programs.

The Simultaneous Effect of Investment, Labor, and Zakat on Economic Growth

The empirical results show that investment, labor, and zakat simultaneously have a significant effect on economic growth. The high F-statistic value indicates that the combination of financial capital, human capital, and social capital provides a comprehensive explanation of economic performance across Indonesian provinces. These findings support previous studies by Rahayu (2023) and Adibah (2024), which show that investment, labor, and zakat jointly contribute to economic growth and poverty reduction.

Utami, Basrowi, and Nasor (2021) explain that productive zakat distribution strengthens consumption and investment activities, thereby contributing to economic expansion. Suprayitno (2020) and Ishak et al. (2022) also show that the integration of Islamic social finance with macroeconomic variables improves economic stability and reduces inequality. These findings suggest that economic growth is influenced by multidimensional factors that include financial investment, labor productivity, and social redistribution mechanisms.

The theoretical contribution of this study lies in the integration of conventional economic variables with Islamic social finance instruments in a unified panel data framework. This approach expands the empirical literature by demonstrating that inclusive economic growth can be achieved through the interaction between capital accumulation, workforce development, and social redistribution mechanisms.

From a policy perspective, the findings suggest that governments should adopt

integrated economic strategies that combine investment promotion, workforce development, and zakat optimization. Strengthening coordination between fiscal policy, labor market policy, and Islamic social finance institutions may enhance economic resilience and promote equitable development across regions.

Finally, the study provides contextual insights relevant to developing countries with Muslim-majority populations. Indonesia's economic structure demonstrates that Islamic social finance instruments such as zakat can complement conventional macroeconomic policies in promoting inclusive and sustainable growth. The integration of economic and social objectives therefore represents an important strategy for achieving long-term development goals.

CONCLUSION

This study analyzes the relationship between investment, labor, and zakat on economic growth in Indonesia during the period 2019–2024 using panel data regression. The findings show that investment has a positive and significant effect on economic growth, indicating that increased capital accumulation contributes to expanding production capacity, encouraging business activity, and creating employment opportunities. Labor also has a positive and significant impact on economic growth, demonstrating that both the quantity and quality of the workforce play an important role in increasing productivity and national output. In addition, zakat has a positive and significant influence on economic growth, suggesting that Islamic social finance contributes to improving purchasing power, supporting consumption, and encouraging inclusive economic participation. Simultaneously, the results confirm that investment, labor, and zakat jointly influence economic growth, indicating that economic development is shaped by the interaction between financial capital, human capital, and social redistribution mechanisms.

From an academic perspective, this study contributes to the development of economic growth literature by integrating conventional macroeconomic variables with Islamic social finance instruments in a panel data framework. The findings strengthen theoretical perspectives such as endogenous growth theory and human capital theory, while also expanding the empirical relevance of Islamic economic instruments, particularly zakat, in influencing

macroeconomic performance. The results demonstrate that inclusive economic growth can be supported not only by investment and labor productivity but also by social finance mechanisms that promote income distribution and social welfare. This study therefore provides empirical evidence that the integration of economic and social instruments is relevant in understanding economic growth dynamics in Muslim-majority countries such as Indonesia.

From a practical perspective, the findings imply that policymakers should continue encouraging investment through regulatory simplification, infrastructure development, and fiscal incentives to strengthen economic competitiveness. Workforce development policies should focus on improving skills, education, and labor productivity to enhance employment quality. Furthermore, optimizing zakat management through transparent, targeted, and productive distribution programs can strengthen its contribution to poverty reduction and economic growth. Future research is recommended to include longer observation periods, additional variables such as education, technology, and financial inclusion, as well as other Islamic social finance instruments such as waqf, in order to provide a more comprehensive understanding of sustainable and inclusive economic development.

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