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Beyond Capital Accumulation: Investment, Islamic Finance, and Labor Force Participation as Drivers of Regional Economic Growth in Indonesia

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Abstract

Regional disparities in economic growth across Indonesian provinces highlight the need to identify key drivers of inclusive and sustainable development. This study examines the effects of investment, Islamic financing, and labor force participation rate (LFPR) on regional economic growth across 34 Indonesian provinces during 2020–2025. Using balanced panel data obtained from Statistics Indonesia (BPS), the Financial Services Authority (OJK), and the Investment Coordinating Board (BKPM), the analysis employs a Fixed Effects Model selected through Chow and Hausman tests. The findings reveal that investment and Islamic financing exert positive and statistically significant effects on regional economic growth, with investment emerging as the most influential determinant. In contrast, LFPR shows a negative but statistically insignificant relationship, suggesting that labor quantity alone is insufficient to stimulate growth without improvements in productivity and formal-sector absorption. Collectively, the three variables significantly explain regional growth dynamics. These findings underscore the importance of strengthening productive investment, expanding access to Islamic finance, and enhancing labor quality to achieve more balanced and sustainable regional development in Indonesia.

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1. Introduction

Regional economic growth remains one of the central indicators used to evaluate the success of development policies and the capacity of regions to improve societal welfare. In developing economies, sustained economic growth is expected not only to increase output but also to reduce poverty, create employment opportunities, and strengthen regional competitiveness. Despite Indonesia's relatively stable macroeconomic performance in recent years, substantial disparities in economic growth persist across provinces, indicating that the benefits of development have not been distributed evenly. These disparities raise important questions regarding the determinants of regional economic performance and the mechanisms through which different forms of capital contribute to economic growth.

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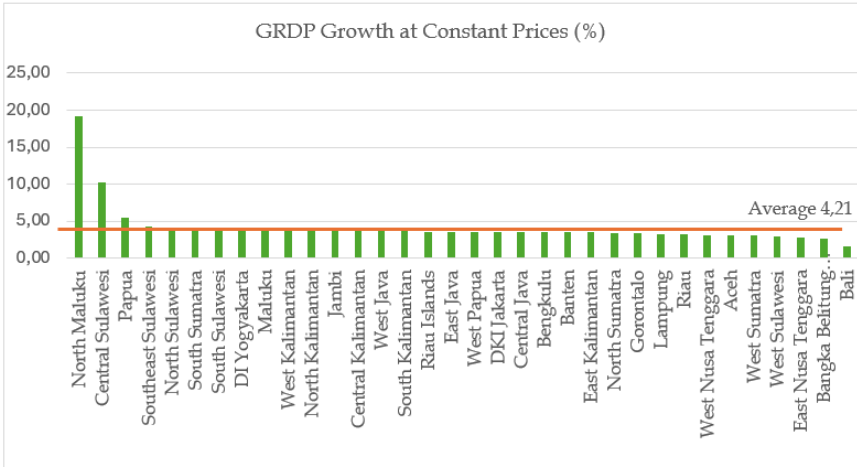
Figure 1. Average Economic Growth per Province in Indonesia, 2020–2025



Source: BPS processed data (2026)

As shown in Figure 1, economic growth across Indonesian provinces exhibits considerable variation. During the 2020–2025 period, only four provinces, namely North Maluku (19.13%), Central Sulawesi (10.34%), Papua (5.54%), and Southeast Sulawesi (4.25%), recorded growth rates above the national average of 4.21%, while the remaining provinces grew below the national benchmark. Bali recorded the lowest average growth rate at 1.68%. These findings indicate that Indonesia's economic growth remains spatially uneven and concentrated in only a limited number of provinces. Such disparities suggest that regional growth dynamics are shaped by heterogeneous economic structures and differing capacities to mobilize productive resources.

The existence of persistent regional disparities highlights the need to identify the factors that effectively drive economic growth at the provincial level. In the context of regional development, three strategic dimensions of capital are particularly relevant: physical capital, financial capital, and human capital. These dimensions are represented in this study by investment, Islamic financing, and the Labor Force Participation Rate (LFPR), respectively. Together, these variables provide a comprehensive framework for understanding the mechanisms through which economic resources are transformed into regional output and development outcomes.

Investment has long been recognized as one of the primary engines of economic growth. Within the expenditure approach to Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP), investment constitutes a major component of aggregate demand and serves as a catalyst for productive capacity expansion (Wang et al., 2022). Higher levels of domestic and foreign investment are expected to stimulate production, create employment opportunities, and accelerate regional economic growth (Sugianto et al., 2021; Todaro & Smith, 2020). Although Indonesia has experienced a continuous increase in investment realization, the geographical distribution of investment remains highly concentrated. According to BRIN (2024), provinces characterized by superior infrastructure, skilled labor availability, abundant natural resources, and stronger financial systems attract disproportionately larger investment inflows than less-developed regions. Consequently, economically advanced provinces continue to benefit from cumulative growth advantages, while less-developed provinces struggle to attract sufficient capital. Previous empirical studies consistently support the positive contribution of investment to economic growth. Fazaalloh (2024), Hadi and Hasmarini (2025), and Syah et al. (2025) all report a positive and statistically significant relationship between investment and regional economic performance.

Beyond physical capital accumulation, financial development plays an equally important role in supporting economic growth. In Indonesia, Islamic finance has emerged as a strategic instrument capable of promoting financial inclusion while supporting productive economic activities. As the country with the largest Muslim population in the world, Indonesia possesses considerable potential for expanding Islamic financial intermediation (Hasanah et al., 2024). Nevertheless, access to Islamic financing remains highly uneven across provinces. Financing activities are concentrated primarily in provinces on Java Island, particularly West Java, Central Java, and East Java, while many provinces continue to experience limited access to Islamic financial services. This imbalance suggests that the contribution of Islamic Rural Banks (BPRS) and other Islamic financial institutions to regional development remains suboptimal.

Theoretically, Islamic financing contributes to economic growth through profit-sharing mechanisms such as *mudharabah* and *musyarakah*, which facilitate the allocation of funds to productive sectors and strengthen the link between finance and real economic activity (Surya et al., 2024). Empirical evidence generally supports this proposition. Furqani and Mulyany (2009) found a positive long-run relationship between Islamic banking development and economic growth, while Arum and Himmati (2021) and Taqiyya et al. (2025) reported that Islamic financing enhances economic growth through improved financial intermediation. However, findings remain inconclusive. Laiya and Fathurrohman (2024) found that the growth effect of Islamic financing depends largely on the effectiveness of financing allocation, whereas Hamidi et al. (2024) documented a positive but statistically insignificant effect. These mixed findings indicate that the relationship between Islamic financing and regional economic growth requires further investigation.

The third dimension examined in this study is human capital, represented by the Labor Force Participation Rate (LFPR). LFPR reflects the proportion of the working-age population actively engaged in the labor market and is commonly viewed as an indicator of labor availability and economic participation (BPS, 2024). Human capital theory suggests that higher labor force participation should increase production capacity and contribute positively to economic growth. Similarly, the Solow-Swan growth framework identifies labor as a fundamental factor of production whose expansion can increase aggregate output (Mankiw et al., 1992). Nevertheless, evidence from Indonesia suggests that a high LFPR does not necessarily translate into stronger economic growth. Provinces such as Papua and East Nusa Tenggara exhibit high LFPR levels but relatively low shares of formal employment, indicating that much of the labor force remains concentrated in low-productivity informal activities. Conversely, provinces such as DKI Jakarta and the Riau Islands demonstrate lower participation rates but substantially higher levels of labor formality. Prior studies likewise report inconsistent findings, with Purba et al. (2024) identifying a positive effect of LFPR on regional output, while Anggraeni and Susanto (2025) found a negative relationship in poorer provinces.

Table 1 further illustrates that provinces with the highest economic growth do not necessarily rank highly in investment, Islamic financing, or LFPR. Likewise, provinces receiving the largest investment inflows often exhibit only moderate growth performance. These patterns indicate that the relationship between economic growth and its determinants is more complex than suggested by conventional theory and that the interaction among different forms of capital deserves closer attention.

Despite a growing body of literature examining investment, Islamic financing, and LFPR individually, studies integrating these three dimensions within a unified framework remain limited. Most previous studies focus on one or two variables, employ incomplete provincial coverage, or rely on data periods that do not adequately capture post-pandemic economic dynamics.

Table 1. Comparison of Average Rankings of Economic Growth, Investment, Sharia Financing, and Labor Force Participation Rate (LFPR) Across Indonesian Provinces, 2020–2025

No.	Province	Economic growth		Investment		Sharia Financing		LFPR	
		Average (%)	Rank	Average (IDR Billion)	Rank	Average (IDR Billion)	Rank	Average (%)	Rank
1	North Maluku	19,13	1	65.598,74	7	150	14	66,47	27
2	Central Sulawesi	10,34	2	93.967,61	4	94,54	18	70,05	13
3	Papua	5,54	3	22.933,80	15	–	–	65,08	28
4	Southeast Sulawesi	4,25	4	20.609,98	16	–	–	69,21	19
5	North Sulawesi	4,19	5	7.675,90	27	–	–	63,72	34
6	South Sumatra	4,03	6	49.151,92	10	17,33	21	69,87	15
7	South Sulawesi	4,00	7	15.572,09	20	106,39	15	65,4	29
8	DI Yogyakarta	3,94	8	4.684,75	31	997,79	5	73,1	4
9	Maluku	3,86	9	2.633,67	33	–	–	64,41	33
10	West Kalimantan	3,80	10	25.943,34	14	–	–	69,08	18
11	North Kalimantan	3,75	11	18.210,07	18	–	–	66,59	26
12	Jambi	3,73	12	9.789,36	24	–	–	67,59	22
13	Central Kalimantan	3,67	13	15.669,23	21	3,41	23	68,96	20
14	West Java	3,66	14	198.284,80	1	4.949,42	1	66,67	25
15	South Kalimantan	3,65	15	18.872,64	19	95,77	17	70,12	11
16	Riau Islands	3,64	16	35.554,92	12	228,13	12	66,89	24
17	East Java	3,63	17	117.628,52	3	1.967,93	3	71,81	7
18	West Papua	3,62	18	6.299,43	29	–	–	65,08	28
19	DKI Jakarta	3,58	19	170.123,11	2	262,81	11	64,67	32
20	Central Java	3,55	20	62.523,83	8	2.578,17	2	71,6	8
21	Bengkulu	3,54	21	6.966,46	28	97,71	16	72,05	5
22	Banten	3,52	22	89.974,70	5	742,79	6	64,99	31
23	East Kalimantan	3,51	23	61.056,50	9	6,56	22	67,31	23
24	North Sumatra	3,47	24	41.120,51	11	165,68	13	70,51	10
25	Gorontalo	3,46	25	3.432,24	32	–	–	68,52	21
26	Lampung	3,30	26	12.076,73	22	714,81	7	71,76	6
27	Riau	3,22	27	70.238,85	6	91,79	19	65,73	28
28	West Nusa Tenggara	3,16	28	32.461,10	13	1.122,39	4	72,12	9
29	Aceh	3,09	29	9.523,21	23	560,84	8	65,08	30
30	West Sumatra	3,07	30	7.798,30	26	391,52	9	70,09	14
31	West Sulawesi	2,97	31	1.586,43	34	–	–	70,34	12
32	East Nusa Tenggara	2,88	32	4.655,39	30	–	–	74,66	3
33	Bangka Belitung Islands	2,73	33	8.614,04	25	229,05	10	69,36	16
34	Bali	1,68	34	22.218,70	17	12,45	24	76,64	1

Note: Dash (–) = BPRS financing data not available.

Source: Statistics Indonesia (BPS), Financial Services Authority (OJK), and Investment Coordinating Board (BKPM), processed by the authors (2026).

Accordingly, this study addresses this gap by examining the simultaneous effects of investment, Islamic financing, and LFPR on regional economic growth across all 34 Indonesian provinces during 2020–2025. By integrating physical capital, inclusive financial capital, and human capital within a single panel-data framework, the study contributes to the literature on regional economic growth and provides policy-relevant evidence for promoting more inclusive, balanced, and sustainable development across Indonesia.

2. Literature Review

Economic Growth and Regional Development

Economic growth is one of the primary indicators used to evaluate regional development performance because it reflects a region's capacity to increase output, generate income, and improve social welfare. In the context of regional economics, growth is generally measured through changes in Gross Regional Domestic Product (GRDP), which captures the value of goods and services produced within a province over a specific period. Sustained economic growth is expected to stimulate employment creation, reduce poverty, and strengthen regional competitiveness. However, growth outcomes often differ substantially across regions due to variations in resource endowments, investment capacity, financial development, labor quality, and institutional conditions. These differences create heterogeneous growth trajectories and contribute to persistent regional disparities.

The growth disparity observed across Indonesian provinces indicates that regional economic performance cannot be explained solely by differences in natural resource availability. Rather, economic growth is influenced by the interaction between physical capital, financial capital, and human capital. In this study, these dimensions are represented by investment, Islamic financing, and the Labor Force Participation Rate (LFPR), respectively. Together, these variables provide a comprehensive framework for understanding the determinants of regional economic growth in Indonesia.

Investment and Regional Economic Growth

Investment constitutes one of the most important drivers of economic growth because it increases productive capacity and expands the stock of physical capital available in an economy. Within the expenditure approach to GDP and GRDP, investment is treated as a key component of aggregate demand and serves as a mechanism through which production capacity is enlarged over time. Higher levels of investment, whether originating from Domestic Direct Investment (PMDN) or Foreign Direct Investment (PMA), are expected to stimulate economic activity through increased capital formation, technological upgrading, and employment creation (Wang et al., 2022; Sugianto et al., 2021; Todaro & Smith, 2020).

The theoretical foundation linking investment and economic growth is rooted in the Harrod-Domar growth model. This framework argues that economic growth is determined by the relationship between savings, investment, and the capital-output ratio. An increase in investment expands productive capacity, which subsequently generates higher output growth. Under this perspective, investment functions as the primary engine of economic expansion because it directly influences the accumulation of capital stock and production efficiency.

In Indonesia, investment realization has continued to increase over time; however, its distribution remains highly uneven across provinces. According to BRIN (2024), provinces characterized by adequate infrastructure, abundant natural resources, skilled labor availability, and stronger financial systems tend to attract significantly larger investment inflows than less-developed regions. Consequently, economically advanced regions continue to accumulate capital at a faster pace, while lagging regions face difficulties in attracting productive investment.

Empirical evidence consistently supports the positive role of investment in promoting economic growth. Fazaalloh (2024) found that foreign direct investment significantly increased regional economic growth across 33 provinces in Indonesia during 2010–2019. Similarly, Hadi and Hasmarini (2025) reported that investment positively influenced GRDP growth across 34 provinces during 2019–2023. Syah et al. (2025) likewise concluded that investment contributed significantly to regional economic performance during 2019–2024. These findings collectively suggest that investment remains a critical determinant of regional growth and development.

H1: Investment has a positive and significant effect on regional economic growth in Indonesia.

Islamic Financing and Regional Economic Growth

Financial development plays a central role in facilitating economic growth by mobilizing savings, allocating resources efficiently, and supporting productive investment. Within the Islamic economic framework, financial intermediation is conducted through Sharia-compliant contracts that emphasize risk sharing, asset backing, and real-sector linkage. Islamic financing therefore differs fundamentally from conventional finance because financing activities are directly connected to productive economic transactions rather than speculative activities.

Indonesia possesses substantial potential for Islamic financial development due to its status as the country with the largest Muslim population in the world (Hasanah et al., 2024). Nevertheless, access to Islamic financing remains highly uneven across provinces. Financing activities are concentrated predominantly on Java Island, particularly in West Java, Central Java, and East Java, while many provinces continue to experience limited access to Islamic financial institutions. This concentration suggests that the contribution of Islamic Rural Banks (BPRS) and other Islamic financial institutions to regional economic growth remains suboptimal and geographically uneven.

From a theoretical perspective, Islamic financing promotes economic growth through profit-sharing contracts such as mudharabah and musyarakah. These contracts encourage productive investment while distributing risks between providers and users of capital. Because financing is tied to real economic activities, Islamic financial intermediation is expected to stimulate entrepreneurship, expand productive sectors, and strengthen financial inclusion, thereby contributing to inclusive economic growth (Surya et al., 2024).

Empirical findings generally support this proposition. Furqani and Mulyany (2009) documented a positive long-run relationship between Islamic banking development and economic growth. Likewise, Arum and Himmati (2021) and Taqiyya et al. (2025) found that Islamic financing contributes positively to economic performance through strengthened financial intermediation. However, the literature also reveals mixed results. Laiya and Fathurrohman (2024) concluded that the effectiveness of Islamic financing depends largely on its allocation to productive sectors, while Hamidi et al. (2024) found a positive but statistically insignificant relationship between profit-sharing financing and economic growth. These divergent findings indicate that the growth effects of Islamic financing remain an important area for further investigation.

H2: Islamic financing has a positive and significant effect on regional economic growth in Indonesia.

Labor Force Participation Rate and Regional Economic Growth

Human capital is widely recognized as a crucial determinant of economic growth because labor serves as a fundamental input in the production process. The Labor Force Participation Rate (LFPR) measures the proportion of the working-age population that is either employed or actively seeking employment and therefore reflects the degree of economic participation within a region (BPS, 2024).

According to human capital theory, higher labor force participation increases a region's productive capacity and contributes to economic growth. Similarly, the Solow-Swan growth model treats labor as one of the principal factors of production, suggesting that increases in labor quantity and quality can enhance aggregate output (Mankiw et al., 1992). Under this framework, regions with higher labor force participation should exhibit stronger economic performance because a larger proportion of the population contributes to productive activities.

However, the relationship between LFPR and economic growth is not always straightforward. The contribution of labor depends heavily on productivity levels, employment quality, and sectoral absorption capacity. Provinces such as Papua and East Nusa Tenggara exhibit relatively high LFPR values but remain characterized by a predominance of low-productivity informal employment. In contrast, provinces such as DKI Jakarta and the Riau Islands demonstrate lower participation rates but substantially higher levels of formal-sector employment. These structural differences create heterogeneity in the relationship between labor participation and economic growth.

Previous empirical studies also report inconsistent findings. Purba et al. (2024) found that LFPR positively influenced GRDP growth in North Sumatra Province. Conversely, Anggraeni and Susanto (2025) reported a negative relationship between LFPR and economic growth in the ten poorest provinces in Indonesia, suggesting that increased labor participation does not necessarily translate into higher productivity or output when employment remains concentrated in low-value-added sectors.

H3: The Labor Force Participation Rate (LFPR) has a significant effect on regional economic growth in Indonesia.

Research Gap and Conceptual Framework

Although numerous studies have examined the effects of investment, Islamic financing, and labor force participation on economic growth, most have analyzed these variables separately. Existing research generally focuses on one dimension of capital while neglecting the interaction among physical capital, financial capital, and human capital. Meanwhile, regional growth is inherently multidimensional and depends on the simultaneous functioning of these three factors. Investment provides physical capital, Islamic financing facilitates inclusive financial intermediation, and LFPR represents the availability of human capital necessary to transform resources into output. Together, these variables form an integrated system that determines regional economic performance.

Accordingly, this study contributes to the literature by examining the simultaneous effects of investment, Islamic financing, and LFPR on regional economic growth across all 34 Indonesian provinces during 2020–2025. The integrated framework developed in this study provides a more comprehensive understanding of regional growth dynamics and offers evidence-based policy implications for promoting inclusive and sustainable economic development in Indonesia.

3. Methodology

Research Design

This study employs a quantitative research approach using panel data regression analysis to examine the effects of investment, Islamic financing, and the Labor Force Participation Rate (LFPR) on regional economic growth across Indonesian provinces. Panel data analysis is selected because it combines cross-sectional and time-series dimensions, enabling a more comprehensive evaluation of regional economic dynamics than either approach alone. By integrating variations across provinces and over time, panel data provides greater degrees of freedom, reduces multicollinearity, and improves estimation efficiency.

The study uses secondary data obtained from official government institutions. Data on regional economic growth and LFPR were collected from Statistics Indonesia (BPS), investment data were obtained from the Investment Coordinating Board (BKPM), and Islamic financing data were sourced from the Financial Services Authority (OJK). The observation period covers 2020–2025, representing the period from the COVID-19 economic contraction, through recovery, to post-pandemic normalization.

The dataset consists of 34 Indonesian provinces observed over six years, producing a balanced panel dataset with a total of 204 observations (34 × 6).

The use of a nationwide provincial dataset is intended to provide a comprehensive representation of regional economic growth dynamics in Indonesia. This approach allows the analysis to capture substantial differences in investment realization, Islamic financial development, labor market participation, and economic performance across provinces.

Variables and Measurement

The study consists of one dependent variable and three independent variables. The dependent variable is regional economic growth, while the independent variables comprise investment, Islamic financing, and the Labor Force Participation Rate (LFPR). The operational definitions of all variables are presented in Table 2.

Table 2. Variable Measurement Indicators

Variable	Abbreviation	Measurement Indicator	Unit	Source
Investment	INV	Total investment (PMDN + PMA) recorded in a region over a one-year period	IDR Billion	BKPM
Islamic Financing	PBS	Total outstanding financing disbursed by Islamic Rural Banks (BPRS)	IDR Billion	OJK
Labor Force Participation Rate	LFPR	Ratio of labor force to working-age population × 100%	Percent (%)	BPS
Gross Regional Domestic Product Growth	GRDP	GRDP growth rate at constant prices	Percent (%)	BPS

Source: Author (2026).

The dependent variable, GRDP growth, is measured using the annual growth rate of Gross Regional Domestic Product at constant prices. This indicator is widely employed in regional economics because it reflects changes in productive capacity and economic performance over time. Investment is measured using the total realization of domestic and foreign investment, while Islamic financing is measured by the total outstanding financing distributed by Islamic Rural Banks (BPRS). LFPR is calculated as the proportion of the labor force relative to the working-age population.

Data Transformation

Before estimation, several variables were transformed to improve data distribution and address differences in measurement scales among variables. Specifically, the Islamic financing variable contains several zero observations because a number of provinces did not report BPRS financing activities during the observation period. To avoid undefined logarithmic values while retaining all observations, the PBS variable was transformed using:

$$\mathrm{Ln}(PBS + 1)$$

The addition of the constant value one serves as a *pseudocount* that enables logarithmic transformation without eliminating observations containing zero values. This approach is recommended for non-negative variables that contain zeros and is widely used in contemporary econometric analysis (Bellégo et al., 2022; Chen & Roth, 2024).

Meanwhile, the investment variable contains no zero values and therefore was transformed using the natural logarithm:

$$\mathrm{Ln(INV)}$$

This transformation reduces scale differences caused by extremely large investment values among provinces and improves coefficient interpretation. The combination of logarithmic and non-logarithmic variables within the same regression framework forms a semi-log model, which is commonly employed when variables are measured in substantially different units (Gujarati & Porter, 2009).

Model Specification

To examine the relationship between investment, Islamic financing, LFPR, and regional economic growth, this study applies a panel data regression model specified as follows:

$$GRDPit=\alpha+\beta1Ln(INVit)+\beta2Ln(PBSit+1)+\beta3LFPRit+eit$$

Where: GRDPit: Regional economic growth; Ln(INVit): Natural logarithm of investment; Ln(PBSit +1): Natural logarithm of Islamic financing plus one; LFPRit: Labor Force Participation Rate; α: Constant; β1,β2,β3: Regression coefficients; eit: Error term; i: Province; t: Year

The model integrates three dimensions of capital simultaneously. Investment represents physical capital, Islamic financing reflects inclusive financial capital, and LFPR serves as a proxy for human capital. This integrated specification allows the study to evaluate the relative contribution of each dimension to regional economic growth.

Estimation Procedure

Panel data regression can be estimated using three alternative approaches: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM). Because each model relies on different assumptions regarding individual heterogeneity, a formal model selection procedure is required to identify the most appropriate estimator.

The selection procedure follows the standard panel data framework proposed by Baltagi (2021). First, the Chow Test is applied to determine whether FEM provides a better fit than CEM. Second, the Hausman Test is employed to compare FEM and REM. Third, where necessary, the Breusch–Pagan Lagrange Multiplier Test is used to evaluate whether REM is preferable to CEM. The final estimation model is selected based on the statistical outcomes of these tests.

Diagnostic Testing and Hypothesis Testing

To ensure the validity and reliability of the regression model, several classical assumption tests are conducted. These include: Normality Test, to evaluate whether residuals are normally distributed, Multicollinearity Test, to detect high correlations among independent variables, Heteroskedasticity Test, to examine whether residual variance remains constant, Autocorrelation Test, to assess correlation among residuals across observations.

Following diagnostic testing, hypothesis testing is performed using the t-test, F-test, and coefficient of determination (R^2). The t-test evaluates the partial effect of each independent variable on regional economic growth, while the F-test assesses whether all explanatory variables jointly influence economic growth. The coefficient of determination (R^2) measures the proportion of variation in GRDP growth explained by investment, Islamic financing, and LFPR.

All statistical analyses were conducted using EViews 13, which is widely utilized in panel data econometric research due to its ability to estimate complex models and perform comprehensive diagnostic testing.

4. Results

Model Selection Results

Panel data regression analysis requires the selection of the most appropriate estimation model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Following the methodological framework proposed by Baltagi (2021), model selection was conducted sequentially using the Chow Test and Hausman Test. The final estimation results indicated that the Fixed Effect Model (FEM) was the most appropriate specification for explaining the relationship between investment, Islamic financing, labor force participation, and regional economic growth across Indonesian provinces during 2020–2025.

The selection of FEM suggests the presence of unobserved provincial heterogeneity that significantly influences economic growth and must therefore be controlled through province-specific intercepts. This finding is consistent with the substantial differences in economic structure, infrastructure availability, investment attractiveness, labor market conditions, and financial development across Indonesian provinces. Consequently, FEM provides more reliable coefficient estimates than pooled or random-effect alternatives.

Furthermore, classical assumption testing indicated the presence of heteroskedasticity. Therefore, hypothesis testing was conducted using robust standard errors, ensuring that the estimated coefficients remained consistent and statistically reliable despite non-constant residual variance.

Partial Significance Test (t-Test)

The t-test was employed to examine the individual effect of each independent variable on regional economic growth. Following heteroskedasticity correction using robust standard errors, the estimation results are presented in Table 6.

Table 6. Partial Significance Test Results (t-Test)

Variable	Coefficient	Std. Error	t-Statistic	t-Table	Prob.
C	-22.56599	20.97157	-1.0760	1.972	0.2897
Ln(INV)	2.82432	0.63327	4.4599	1.972	0.0001
Ln(PBS)	1.45024	0.58810	2.4660	1.972	0.0190
LFPR	-0.08781	0.26493	-0.3314	1.972	0.7424

Source: Data processed using EViews 13.

Based on the Fixed Effect Model estimation results, the panel regression equation can be expressed as: The estimated constant value of **−22.56599** indicates that if investment, Islamic financing, and LFPR are hypothetically equal to zero, regional economic growth would decline by approximately 22.57 units. Although the constant itself is not statistically significant, it serves as a baseline value within the regression model.

Effect of Investment on Regional Economic Growth

The estimation results indicate that investment exerts a positive and statistically significant effect on regional economic growth. The coefficient of 2.82432 implies that a 1% increase in investment is associated with an increase of approximately 0.02824 units in regional economic growth, holding other variables constant. The statistical significance of this relationship is confirmed by a t-statistic of 4.4599, which exceeds the critical value of 1.972, and a probability value of 0.0001, which is substantially below the 5% significance threshold. Consequently, the first hypothesis is accepted.

Among all explanatory variables included in the model, investment exhibits the largest coefficient value, indicating that physical capital accumulation remains the strongest driver of regional economic growth in Indonesia. This finding supports the Harrod–Domar growth framework, which argues that investment stimulates economic expansion through capital formation and productive capacity enhancement.

The provincial evidence presented in Table 1 further supports this conclusion. Central Sulawesi recorded both high investment realization and one of the highest economic growth rates during the observation period. Similarly, the Riau Islands displayed relatively strong consistency between investment performance and economic growth outcomes. These patterns suggest that productive investment continues to play a central role in accelerating regional output growth.

Effect of Islamic Financing on Regional Economic Growth

Islamic financing also demonstrates a positive and statistically significant effect on regional economic growth. The coefficient of 1.45024 indicates that a 1% increase in Islamic financing contributes approximately 0.01450 units to regional economic growth, assuming other factors remain unchanged. Statistical evidence confirms this relationship through a t-statistic of 2.4660, which exceeds the critical value of 1.972, and a probability value of 0.0190, which is lower than the 5% significance level. Accordingly, the second hypothesis is accepted.

These findings suggest that Islamic financial intermediation contributes meaningfully to regional economic development. Unlike conventional financing mechanisms, Islamic financing is closely linked to real-sector activities through profit-sharing contracts and asset-backed transactions. As a result, increases in Islamic financing are more likely to be translated into productive investment, business expansion, and employment creation.

Provincial patterns also provide supporting evidence. East Kalimantan and DI Yogyakarta exhibit relatively close alignment between Islamic financing rankings and economic growth performance. These findings reinforce the argument that Islamic financial institutions can serve as effective channels for mobilizing capital and supporting regional economic development.

Effect of Labor Force Participation Rate on Regional Economic Growth

In contrast to investment and Islamic financing, the Labor Force Participation Rate (LFPR) exhibits a negative but statistically insignificant effect on regional economic growth. The estimated coefficient of −0.08781 suggests that a one-unit increase in LFPR is associated with a decline of approximately 0.08781 units in economic growth, ceteris paribus. However, the t-statistic of −0.3314 is substantially lower than the critical value of 1.972, while the probability value of 0.7424 greatly exceeds the 5% significance threshold. Therefore, the third hypothesis is rejected.

The absence of a significant relationship indicates that labor quantity alone is insufficient to stimulate regional economic growth. This finding reflects structural characteristics of Indonesia's labor market, where a large proportion of workers remain concentrated in low-productivity informal activities. Under such conditions, increases in labor force participation do not necessarily translate into higher output growth.

The negative coefficient may also indicate the existence of labor-market mismatch, whereby increases in labor supply are not accompanied by corresponding improvements in labor quality or formal-sector absorption. Consequently, higher labor force participation may create additional pressure on labor markets without generating proportional gains in productivity. These findings are consistent with previous studies reporting insignificant or negative relationships between LFPR and economic growth in Indonesia.

Overall Interpretation of the Findings

Collectively, the results demonstrate that regional economic growth in Indonesia is primarily driven by the accumulation of physical capital and the expansion of Islamic financial intermediation. Investment emerges as the most influential determinant, followed by Islamic financing. Meanwhile, labor force participation does not exert a statistically meaningful influence on economic growth when examined independently.

These findings imply that accelerating regional economic growth requires more than simply increasing labor participation rates. Instead, policies should focus on improving labor productivity, expanding formal-sector employment opportunities, and strengthening vocational and competency-based training systems. Simultaneously, efforts to improve investment distribution and expand access to Islamic financing across provinces remain essential for promoting more balanced and sustainable regional economic development.

5. Discussion

The findings of this study provide important insights into the determinants of regional economic growth in Indonesia during the 2020–2025 period. The empirical results indicate that investment and Islamic financing significantly promote economic growth, whereas the Labor Force Participation Rate (LFPR) does not exhibit a statistically significant effect. These findings suggest that the quality and productivity of economic resources are more important than their mere quantity in driving regional development.

The Role of Investment in Promoting Regional Economic Growth

The positive and significant effect of investment confirms the fundamental proposition of growth theory that capital accumulation remains a primary engine of economic expansion. The estimated coefficient indicates that investment contributes the largest effect among all explanatory variables included in the model, highlighting the critical role of physical capital formation in stimulating regional output growth. This finding is consistent with the Harrod-Domar framework, which emphasizes that increases in investment expand productive capacity, generate employment opportunities, and accelerate economic activity through multiplier effects.

The results also align with previous empirical studies conducted in Indonesia. Fazaalloh (2024) found that foreign direct investment significantly increased regional economic growth across Indonesian provinces. Similarly, Hadi and Hasmarini (2025) and Syah et al. (2025) reported that investment contributed positively to regional economic performance. The consistency of these findings reinforces the argument that investment remains one of the most effective instruments for accelerating regional development.

However, the descriptive evidence presented in Table 1 demonstrates that high investment does not automatically guarantee the highest economic growth. West Java, DKI Jakarta, and East Java ranked first, second, and third in investment realization, yet they did not record the highest economic growth rates. In contrast, North Maluku and Central Sulawesi achieved substantially higher growth despite receiving lower investment inflows. This discrepancy suggests that the effectiveness of investment depends not only on its magnitude but also on its allocation efficiency and sectoral composition.

Regions experiencing rapid growth generally allocate investment toward productive sectors with strong backward and forward linkages, such as manufacturing, mining, agro-industry, and infrastructure. Conversely, investment concentrated in capital-intensive sectors may generate limited spillover effects on regional economies. Therefore, investment effectiveness is influenced by local economic structures, institutional quality, and the capacity of regional governments to transform capital inflows into sustainable economic activity.

These findings support the view that investment serves as a necessary but not sufficient condition for regional economic growth. The developmental impact of investment ultimately depends on how efficiently capital is transformed into productive output and employment opportunities.

The Contribution of Islamic Financing to Economic Growth

The positive and statistically significant effect of Islamic financing provides evidence that Sharia-based financial intermediation contributes meaningfully to regional economic development. This finding supports the theoretical argument that Islamic finance facilitates economic growth by channeling financial resources toward productive activities through profit-sharing and asset-backed contracts.

Unlike conventional financing systems that may be partially detached from real-sector activities, Islamic financing requires underlying economic transactions and therefore strengthens the connection between financial development and productive investment. Through contracts such as *mudharabah* and *musyarakah*, Islamic financial institutions encourage entrepreneurship, support small and medium-sized enterprises, and promote broader financial inclusion.

The results are consistent with previous studies by Furqani and Mulyany (2009), Arum and Himmati (2021), and Taqiyya et al. (2025), which documented positive relationships between Islamic financial development and economic growth. The present study extends this evidence by demonstrating that Islamic financing contributes significantly to provincial economic growth across Indonesia during the post-pandemic recovery period.

Nevertheless, Table 1 reveals substantial disparities in the distribution of Islamic financing. West Java, Central Java, and East Java dominate financing realization, while many provinces still report limited or unavailable BPRS financing data. This imbalance suggests that the economic benefits of Islamic financial development remain geographically concentrated.

The unequal distribution of Islamic financing may constrain its contribution to inclusive regional development. Provinces with weak Islamic financial infrastructure face greater difficulties in accessing productive financing, limiting opportunities for entrepreneurship and business expansion. Consequently, although Islamic financing has demonstrated a positive growth effect, its overall contribution could be substantially enhanced through broader regional penetration and improved institutional capacity.

Another important implication concerns the quality of financing allocation. Islamic financing contributes most effectively to economic growth when directed toward productive sectors such as manufacturing, agriculture, trade, and micro-enterprises. Therefore, expanding financing volumes alone may not be sufficient; policy attention should also focus on ensuring that financing supports value-creating economic activities.

Why Labor Force Participation Does Not Significantly Affect Economic Growth

Contrary to theoretical expectations, LFPR does not exhibit a significant effect on regional economic growth. This finding suggests that labor quantity alone is insufficient to generate sustained economic expansion. Although human capital theory and the Solow growth model identify labor as a key production factor, the productivity of labor ultimately determines its contribution to economic growth.

One possible explanation is the prevalence of low-productivity employment across many Indonesian provinces. A large proportion of workers remain concentrated in informal sectors characterized by low wages, limited technological adoption, and minimal value-added creation. Under these conditions, increases in labor force participation may expand labor supply without generating proportional increases in output.

The descriptive evidence also illustrates this phenomenon. Bali recorded the highest LFPR among all provinces but simultaneously experienced the lowest average economic growth during the observation period. Similarly, East Nusa Tenggara demonstrated relatively high labor participation despite comparatively modest economic performance. These patterns indicate that labor market participation alone does not guarantee higher economic productivity.

Another explanation relates to labor-market mismatch. Economic growth increasingly depends on skills, technological capabilities, and workforce adaptability. When labor force expansion is not accompanied by improvements in education, vocational training, and technological competence, the contribution of labor to economic growth becomes limited. Consequently, regions may experience increasing labor participation without achieving corresponding gains in productivity.

The insignificant relationship between LFPR and economic growth therefore highlights the importance of focusing on labor quality rather than merely increasing labor quantity. Human capital development remains a crucial prerequisite for transforming labor participation into sustainable economic growth.

Policy Implications and Recommendations

The findings of this study generate several important policy implications for regional economic development in Indonesia.

First, policies should prioritize improving the quality and distribution of investment rather than focusing solely on increasing investment volumes. Provincial governments need to strengthen investment ecosystems through infrastructure development, regulatory simplification, and institutional improvements. Particular attention should be directed toward lagging regions that continue to receive relatively low levels of investment despite possessing substantial economic potential.

Second, the positive contribution of Islamic financing suggests that policymakers should accelerate the expansion of Islamic financial services beyond the major economic centers of Java. Strengthening the institutional capacity of Islamic Rural Banks (BPRS), promoting digital Islamic financial services, and improving financial literacy can enhance access to Sharia-compliant financing in underserved regions. Expanding productive financing for micro, small, and medium-sized enterprises (MSMEs) is especially important because these enterprises constitute a major source of regional employment and economic activity.

Third, the insignificant effect of LFPR indicates that labor market policies should emphasize workforce quality rather than participation rates alone. Government programs should focus on vocational education, technical training, digital skills development, and industry-oriented competency certification. Improving workforce productivity will enable labor resources to contribute more effectively to regional economic growth.

Finally, policymakers should adopt an integrated development strategy that simultaneously strengthens physical capital, financial capital, and human capital. Sustainable regional growth cannot be achieved through isolated interventions. Instead, coordinated policies that combine investment promotion, Islamic financial development, and human capital enhancement are required to reduce regional disparities and support inclusive economic development across Indonesian provinces.

Such an integrated policy framework would enable Indonesia to achieve more balanced regional growth while maximizing the developmental benefits of investment, Islamic financing, and labor market participation in the long term.

6. Conclusion

This study examined the effects of investment, Islamic financing, and the Labor Force Participation Rate (LFPR) on regional economic growth across 34 Indonesian provinces during the 2020–2025 period using a panel data regression approach. The empirical findings reveal that investment and Islamic financing exert positive and statistically significant effects on regional economic growth, whereas LFPR does not demonstrate a significant influence.

Among the explanatory variables, investment emerged as the most influential determinant of economic growth. This finding confirms the importance of physical capital accumulation in expanding productive capacity, stimulating economic activity, and accelerating regional development. The result supports the proposition that regions with greater investment realization tend to achieve higher economic performance, although the effectiveness of investment remains dependent on allocation efficiency and regional economic structures.

Islamic financing was also found to contribute positively and significantly to regional economic growth. This result indicates that Sharia-based financial intermediation plays an important role in supporting productive economic activities through financing mechanisms that are closely linked to the real sector. The findings suggest that expanding access to Islamic financing may strengthen regional economic development, particularly through support for entrepreneurship and productive business activities.

In contrast, LFPR did not significantly affect economic growth. This result implies that labor quantity alone is insufficient to generate higher economic performance. The contribution of labor to economic growth appears to depend more on productivity, skills, employment quality, and the capacity of regional economies to absorb workers into productive sectors. Consequently, increasing labor participation without corresponding improvements in human capital quality may have limited effects on economic growth.

Overall, the study demonstrates that regional economic growth in Indonesia is driven primarily by the interaction between physical capital and financial capital rather than labor participation alone. These findings highlight the importance of strengthening investment performance, expanding Islamic financial inclusion, and improving labor productivity to achieve more inclusive and sustainable regional economic development.

Despite providing comprehensive evidence at the provincial level, this study is limited by the use of aggregate regional data and a relatively short observation period. Future research may incorporate additional variables such as human capital quality, infrastructure development, institutional quality, technological innovation, and poverty reduction indicators to provide a more comprehensive understanding of regional economic growth dynamics in Indonesia.

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