

The Impact of Domestic Investment, Human Development Index (HDI), and TPT on Poverty in Riau Islands Province in 2017-2024

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ABSTRACT

This study aims to analyze the influence of Domestic Investment (PMDN), Human Development Index (HDI), and Open Unemployment Rate (TPT) on the poverty line in the Riau Islands Province during the 2017-2024 period. This research employs a quantitative approach with panel data regression analysis using EViews 12, covering seven districts/cities with secondary data from BPS and BKPM. The results show that partially, PMDN and HDI have a positive and significant effect on the poverty line, while TPT has no significant effect. Simultaneously, all three variables have a significant effect with a determination coefficient of 95.97%. These findings indicate that capital-intensive investment concentrated in Batam has not reached marine-based productive sectors in the hinterland, while HDI improvement is enjoyed more by urban communities. This study implies the need for equitable investment distribution policies and strengthening the marine economic value chain to effectively reduce poverty in coastal communities.

INTRODUCTION

Poverty remains a crucial agenda in the development process of various countries, including Indonesia, due to its direct impact on the quality of life and national economic stability Purwono et al., (2021). In the development perspective, poverty is often influenced by policy structures that determine the distribution of access to resources and economic opportunities. This means that poverty is not merely a result of individual weaknesses but can also stem from development policies that have not fully favored vulnerable groups. In Indonesia, the Riau Islands Province (Kepri) presents a unique poverty phenomenon due to its characteristics as an archipelagic region with coastal communities dependent on the marine sector. Unlike national poverty patterns generally concentrated in disadvantaged rural areas, poverty in Kepri has complex structural and cultural dimensions, particularly among coastal communities and the Orang Laut (Sea Tribe) Wahyuni et al., (2022).

Poverty in the Riau Islands has distinctive characteristics, especially among coastal communities and the Orang Laut, who have lived nomadically at sea for generations. Research by Wahyuni et al., (2022) in *Poverty Mapping in the Border Region of the Country: A Study on Indonesia and Malaysia*, Kepulauan Riau found that poverty in this region is influenced by development policies that inadequately consider traditional marine-based livelihoods and limited access to education, health services, formal employment, and basic infrastructure, especially in archipelagic and border areas such as Natuna, Lingga, and Anambas. The cultural adaptation patterns of coastal communities dependent on marine resources face serious challenges due to fisheries sector modernization with large vessels and modern fishing technology that marginalize traditional fishermen Satria & Matsuda, (2004). Chou, (2010) in his study of the Orang Laut in Kepri, explained that the nomadic lifestyle, which historically did not recognize land ownership and fixed assets concepts, causes this community to experience difficulties adapting when the government encourages settlement programs on land. Meanwhile, migration flows to Batam and Tanjungpinang as industrial centers create urban poverty pockets, where migrants not absorbed by the formal labor market actually streng then the informal sector with uncertain income Todaro & Smith, (2015).

Kepri Province presents a sharp development inequality phenomenon between the BARELANG metropolitan area (Batam, Rempang, Galang) and archipelagic districts such as Anambas, Natuna, Lingga, and Karimun. According to BPS data, Batam City as a growth center contributes more than 65% to Kepri Province's GRDP, and when combined with other BARELANG areas, the contribution reaches more than 80% of the total provincial economy (BPS Kepri, 2024). This phenomenon aligns with the Growth Pole Theory proposed by Perroux, (1955), stating that economic growth does not occur evenly in all places but concentrates in growth poles driven by leading industries. Batam's success as a growth pole is inseparable from the role of the Batam Concession Agency as a free trade area authority that obtained free status since 1971, with authority in land management, investment licensing, and infrastructure development (BP Batam, 2023). Conversely, archipelagic districts

such as Anambas, Natuna, and Lingga record far lagging investment values and infrastructure development BPS Kepri, (2024). This condition reinforces Myrdal's (1957) theory of backwash effects, where capital resources and skilled labor are sucked from peripheral areas to growth centers, weakening the local economy and deepening inter-regional inequality.

Based on 2024 BPS data, Kepri ranks 4th among provinces with the lowest poverty rates in Indonesia, with a poor population percentage of only 4.78% or approximately 124,960 people. This figure is far below the national average and shows the regional government's relative success in controlling poverty. However, the equitable distribution of development outcomes has not been fully achieved in Kepri Province. This is reflected in the sharp contrast between the rapid progress of the BARELANG area under BP Batam's control and the underdeveloped conditions of the archipelagic districts of Anambas, Natuna, and Lingga, as well as the complexity of poverty problems among coastal communities and the Orang Laut whose traditional marine-based livelihoods have not been touched by development benefits. Rongen et al., (2024) emphasize that inter-regional inequality can create poverty traps even though macro indicators show progress; meanwhile, in urban areas, migration flows to Batam actually give birth to new poverty pockets.

Poverty alleviation efforts require targeted strategies according to economic theory sources, especially in three main aspects: increasing domestic investment, strengthening human resource quality, and controlling unemployment rates. In Smith, (1937) thought, domestic investment plays an important role because capital accumulation can increase production capacity and create employment opportunities. Human resource quality is also a key factor in poverty reduction, where better education and health will encourage productivity and income, according to the human capital concept proposed by Becker, (1975). Additionally, unemployment is a direct determinant of poverty due to loss of income and household purchasing power, as explained by Todaro & Smith, (2015). These three factors are interrelated and form an important foundation for the success of inclusive economic development in the Riau Islands region.

Domestic investment (PMDN) has a strategic role in advancing the regional economy. Domestic capital flows are expected to increase production, create jobs, and expand business opportunities. With increasing PMDN, new jobs will be created that can help people obtain regular income, thereby increasing purchasing power and reducing poverty rates Safitri & Saleh, (2020). Many studies have found that PMDN can reduce poverty if directed toward labor-intensive sectors that absorb local workers and not refer to capital-intensive sectors Sulistiyo & Wiganepdo, (2024). However, if investment is more absorbed in capital-intensive sectors, its impact on employment absorption becomes limited. During the 2017–2024 period, the PMDN value in Riau Islands Province experienced changes from year to year, showing an unstable movement pattern. Based on data from the Ministry of Investment/BKPM (2024), the average PMDN value during this period was

recorded at Rp952.22 billion, with the lowest value in 2017 at Rp19.96 billion and the highest in 2020 reaching Rp2.03 trillion.

The Human Development Index (HDI) is another equally important factor. HDI, which reflects the quality of education, health, and living standards, has been proven to be closely related to human development and capable of accelerating poverty reduction Djokoto, (2022). Education and job skills training programs need to be expanded, especially in archipelagic areas with limited access. Additionally, improving health services and community nutrition is also important to support labor productivity. HDI also shows a consistent increasing trend from year to year. Based on publications from the Riau Islands Province Central Bureau of Statistics (BPS Kepri, 2024), the average HDI during the research period reached 73.36, with the lowest value of 71.92 in 2017 and the highest of 75.14 in 2024. This increase illustrates improvements in the quality of education, health, and living standards of people in the Riau Islands region.

Furthermore, the Open Unemployment Rate (TPT) is an important variable in studying poverty. In classical and modern economic theory regarding the unemployment-income-poverty relationship proposed by Todaro & Smith, (2015), increasing unemployment will worsen poverty because many people lose their source of income. However, several empirical studies show that the effect of TPT on poverty is not always significant, depending on the regional economic structure and availability of social protection programs Purwono et al., (2021). Looking at Riau Islands data, unemployment fluctuations are also related to the industrial sector that dominates the regional economy. This sector is vulnerable to external shocks, including global crises and pandemics. Meanwhile, TPT shows a fluctuating pattern throughout the research period. Based on BPS Kepri data (2024), the average TPT value during 2017–2024 was recorded at 5.34%, with the highest figure of 7.18% in 2020 and the lowest of 3.52% in 2024.

This research has urgency because it aligns with the direction of regional development as stated in the Riau Islands Province RPJMD 2025-2029, which emphasizes that the five-year development strategy focuses on increasing PMDN investment realization as a measure of regional economic performance in supporting job creation and poverty alleviation. In the RPJMD document, Batam, Bintan, and Tanjungpinang are designated as economic growth center clusters, where PMDN investment is directed toward processing industry, logistics, and tourism development. Additionally, the RPJMD also emphasizes the importance of improving human resource quality through three accesses: education, health, and job skills, as well as reducing TPT through policies to expand employment opportunities, increase labor-intensive investment, and synchronize education with labor market needs, as efforts to encourage inclusive economic growth and poverty reduction in the region.

Based on a review of previous research, a research gap was found in poverty analysis in archipelagic regions that function as hinterlands or buffer areas for metropolitan growth centers. The hinterland concept geographically and economically refers to areas located near growth centers, functioning to

provide raw materials, food, and resources for the core area, and economically dependent on these growth centers. In the Riau Islands context, this center-hinterland relationship is very evident since the initiation of the Sijori Growth Triangle (Singapore-Johor-Riau) in 1989, where Singapore initiated the hinterlandization vision by providing capital, while Johor and Riau (now Kepri) provided land and labor Salim, (2021). Consequently, Batam developed as the main growth center with concentrated investment and economic activities, while archipelagic districts such as Bintan, Karimun, Lingga, Natuna, and Anambas function as hinterland areas economically dependent on Batam, reflected in limited investment in archipelagic areas, concentration of skilled labor in the center, and minimal infrastructure in buffer areas. Similar phenomena can also be observed in other archipelagic provinces such as Bangka Belitung Agustina, (2021) as well as in studies of center-hinterland interactions in Kendari, Southeast Sulawesi, which examine the interaction between city center economic growth and surrounding areas Anggraini et al., (2025), Medan Purba, (2024), and areas around the new capital city (IKN) Diana et al., (2025)

In terms of research context, most previous studies on poverty and economic growth are still dominated by studies at the national level or in provinces on Java Island and DKI Jakarta, while studies focusing on archipelagic regions as hinterlands of metropolitan growth centers are still very limited Chhaty et al., (2025). The Riau Islands region has different economic, geographical, and employment structure characteristics for example, the high rate of labor migration to Batam from various regions, especially Java, has made Batam a major urban center while other areas in this province have not developed in a balanced manner Salim, (2021). The variation in previous research results where PMDN and HDI have negative effects on poverty in some studies but are insignificant in other studies when investment is absorbed in capital-intensive sectors further emphasizes the importance of contextual studies in archipelagic regions. Thus, this research is important because it fills the study gap on the influence of PMDN investment, HDI, and TPT on poverty in archipelagic regions functioning as hinterlands of metropolitan growth centers, taking the Riau Islands Province as a case study.

THEORETICAL REVIEW

Vicious Circle of Poverty Theory

The Vicious Circle of Poverty theory was proposed by Ragnar Nurkse (1953) in his book *Problems of Capital Formation in Underdeveloped Countries*. Nurkse viewed poverty as a cycle arising from the interaction of mutually reinforcing economic factors. Low income limits saving capacity, which ultimately hinders capital accumulation for investment. Without adequate investment, productivity is difficult to increase, so the poverty cycle continues. To break this cycle, economic intervention is needed to improve the main components causing poverty: investment and productivity. In the context of this research, Nurkse's theory is relevant to explain how PMDN investment, human

resource quality improvement through HDI, and unemployment rates are interrelated in influencing poverty in archipelagic regions.

Growth and Poverty Theory in Peripheral Areas (Periphery Poverty)

In through Perroux, (1955) about Growth Pole Theory explained that economic growth tends to concentrate in certain areas. Myrdal (1957) through the concept of cumulative causation explained that when growth is concentrated in the center, peripheral areas can experience increased vulnerability to poverty because capital resources and labor are drawn to growth centers (backwash effects). Friedmann (1967) in the core-periphery model added that poverty in peripheral areas is structural, where peripheral areas become providers of natural resources and labor for growth centers but do not gain adequate access to development outcomes. These theories are used to understand how growth dynamics in the center Batam affect poverty conditions in the archipelagic peripheral areas (Anambas, Natuna, Lingga, Karimun).

H1: Domestic Investment (PMDN) is hypothesized to partially influence the poverty line in Riau Islands Province in 2017–2024.

Previous studies show varying results. Sulistiyo & Wiganepdo, (2024) found that PMDN can reduce poverty if directed toward labor-intensive sectors. Vidriza & Ananta, (2024) in a study of nickel-producing provinces found that PMDN consistently shows a real contribution to reducing poverty rates. Conversely, Piecesa, (2023) revealed that if investment is more absorbed in capital-intensive sectors, its impact on employment absorption becomes limited.

H2: Human Development Index (HDI) is hypothesized to partially influence the poverty line in Riau Islands Province in 2017–2024.

In thought Sen, (2000) emphasized that human development is not merely economic growth but also the expansion of basic human capabilities. Research by Sugiyanto & Pamungkas, (2023) found that good health enables individuals to work more productively, thereby increasing household income. Djokoto, (2022) proved that HDI is closely related to human development and can accelerate poverty reduction. However, Wahyuni et al., (2022) in a study in Kepri found that coastal and archipelagic communities face disparities in access to quality education and health facilities.

H3: Open Unemployment Rate (TPT) is hypothesized to partially influence the poverty line in Riau Islands Province in 2017–2024.

In thought Todaro & Smith, (2015) stated that increasing unemployment will worsen poverty due to loss of income sources. Mankiw, (2021) emphasized that high unemployment will decrease aggregate income and increase the likelihood of individuals falling below the poverty line. However, Purwono et al., (2021) showed that the effect of TPT on poverty is not always significant, depending on the regional economic structure. Suhesti, (2023) in a study in Bangka Belitung Islands Province found that unemployment has a negative and insignificant effect on poverty due to the dominance of the informal sector.

H4: Domestic Investment (PMDN), Human Development Index (HDI), and Open Unemployment Rate (TPT) are hypothesized to simultaneously influence the poverty line in Riau Islands Province in 2017–2024.

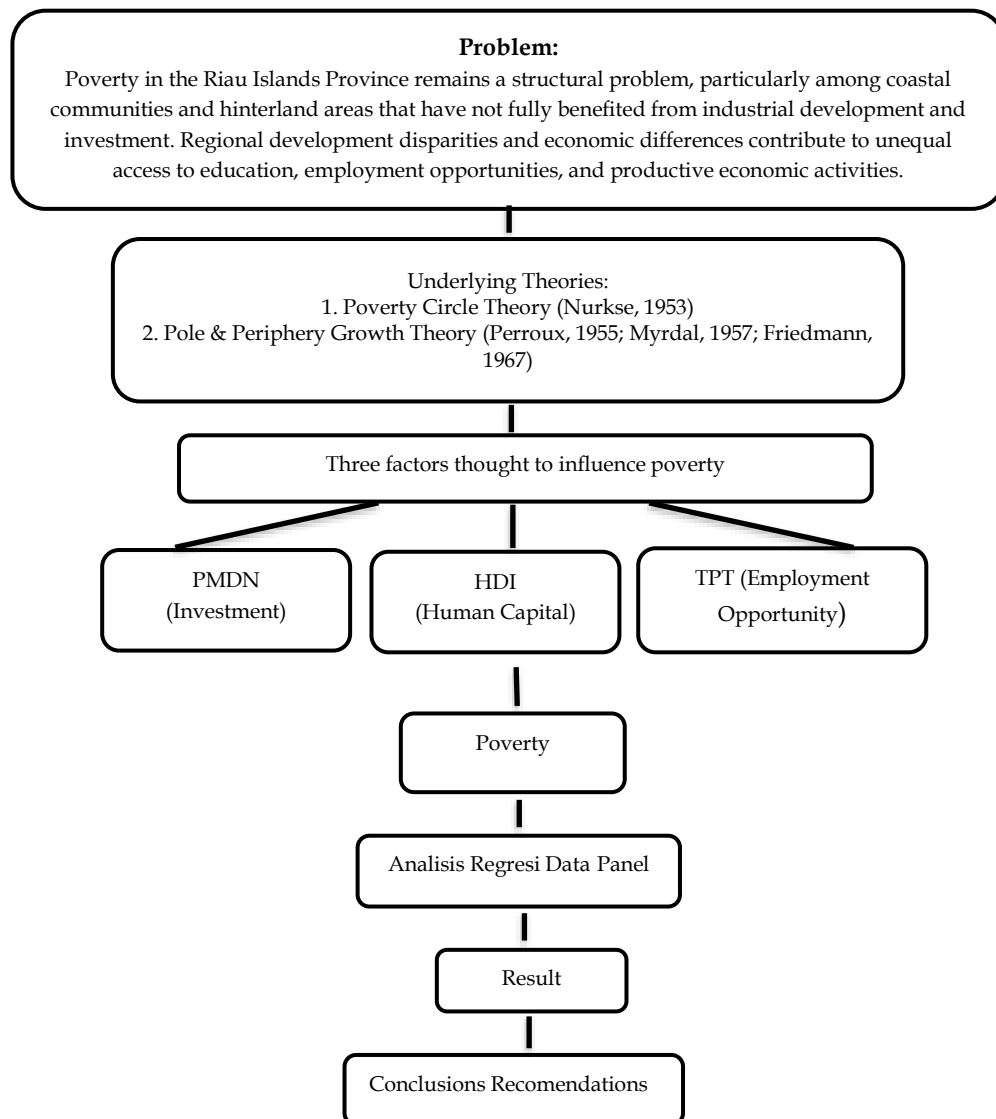


Figure 1. Conceptual Framework

METHODOLOGY

This study employs a quantitative approach with descriptive and verification research types. The quantitative approach was chosen because this study aims to test the influence between variables through numerical data measurement and statistical analysis, as explained by Kuncoro, (2013)) that quantitative research emphasizes theory testing through measuring variables with numbers and conducting data analysis using statistical procedures to find relationships between variables. The descriptive nature is used to describe the characteristics of each research variable, while the verification nature is used to test hypotheses regarding the influence of independent variables on the dependent variable.

The data sources used in this research are secondary data obtained from official government institutions, namely the Central Bureau of Statistics (BPS) of Riau Islands Province and the Investment Coordinating Board (BKPM) of Riau Islands Province. Secondary data is data that has been collected and published

by other parties for specific purposes but can be reused for research interests Arikunto, (2010).

Table 1. Description of Variable

Variable	Indicator	Source
Poverty Line	Rupiah (Rp)	Central Statistics Agency
Domestic Investment	Billions of Rupiah (Rp)	The Investment Coordinating Board
Human Development Index (HDI)	Percentage (%)	Central Statistics Agency
Open Unemployment Rate	Percentage (%)	Central Statistics Agency

Panel data regression analysis is used in this study to identify and measure the influence of each variable on the poverty line in Riau Islands Province during the 2017-2024 period. Baltagi, (2009) explains that this method was chosen because it can combine two data dimensions, namely time series and cross-section dimensions, thus providing more accurate and informative estimation results compared to using only one type of data. Before determining the most appropriate model in panel data regression estimation, Chow test and Hausman test are conducted. The equation form of the model in this study is as follows:

$$Poverty\ Line_{it} = \alpha + \beta_1 PMDN_{it} + \beta_2 HDI_{it} + \beta_3 TPT_{it} + \varepsilon_{it} \tag{1}$$

Notes:

Y_{it} = Poverty Line district/city ke- i in year $-t$.

α = Constanta

X_{1it} = Domestic Investment.

X_{2it} = Human Development Index (HDI).

X_{3it} = Open Unemployment Rate.

$\beta_1 \beta_2 \beta_3$ = Coefisien Regresi

ε_{it} = Error term

i = Crossection (district/city)

t = Unit Time Series (2017-2024)

The population in this study covers all districts/cities in Riau Islands Province, consisting of five districts and two cities: Bintan Regency, Karimun Regency, Lingga Regency, Natuna Regency, Anambas Islands Regency, Batam City, and Tanjungpinang City. The sample uses a saturated sampling technique where all seven districts/cities are used as research samples with an observation period of 8 years (2017-2024), resulting in 56 observation data points.

Model selection in panel data regression is carried out through three stages. First, the Chow test to choose between the Common Effect Model (CEM) and Fixed Effect Model (FEM). Second, the Hausman test to choose between FEM and Random Effect Model (REM). Third, the Lagrange Multiplier (LM) test if needed to choose between REM and CEM. Classical assumption tests include normality test using Jarque-Bera, multicollinearity test using correlation matrix, and heteroscedasticity test using the Glejser method. Hypothesis testing uses the t-test for partial effects, F-test for simultaneous effects, and coefficient of determination (R^2) to measure the model's explanatory power. All data analysis was performed using EViews 12 software.

RESULTS

Chow Test

This test was conducted to determine which model is more appropriate, the Fixed Effect Model (FEM) or the Common Effect Model (CEM). The test was conducted by observing the Chi-Square Probability value.

Tabel 2. Chow Test

Effects Test	Statistic	d.f	Prob
Cross-sctn F	69.9482	(6.46)	0.0000
Cross-sctn Chi- square	129.633	6	0.0000

Source: Eviews Data Processing Results (2025)

Based on Table 2 above, the Chi-Square Prob value is 0.0000, which means it is less than 0.05. Therefore, it can be concluded that the most appropriate model to use is the Fixed Effect Model (FEM), so H_0 is rejected and H_1 is accepted.

The Hausman Test

This test is conducted to determine which model is more appropriate between the Fixed Effects Model (FEM) and the Random Effects Model (REM). The test is conducted by considering the Random Cross-Section Probability value.

Tabel 3. Hausman Test

Correlated Random Effect-Hausmen Test

Test Summary	Chi-sq Statistic	Chi-sq.d.f	Prob
Cross-Sctn random	10.1388	3	0.017

Source: Eviews Data Processing Results (2025)

Based on Table 3 above, the Cross-Section Random Prob value is 0.0003, which means the value is smaller than 0.05. Therefore, it can be concluded that the most appropriate model to use is the Fixed Effect Model (FEM), so that H_0 is rejected and H_1 is accepted. Thus, the results of the Hausman test confirm the results of the previous Chow test, namely FEM is the selected model. Thus, the

Lagrange Multiplier (LM) test is not required further, and the next model estimation will use the Fixed Effect Model approach.

Classical Assumption Test Results

Normality Test

The purpose of the normality test is to identify whether the residual data is normally distributed. According to Upendra et al., (2023) the Jarque-Bera test is a method used to test the normality of residuals in a regression model by calculating skewness and kurtosis values. Interpretation of the results of this test depends on the Jarque-Bera probability value. If the value is greater than 0.05, the data can be identified as normally distributed.

Multicollinearity Test

According to Kim, (2019) the Variance Inflation Factor (VIF) is one of the most commonly used measures to identify the level of collinearity between explanatory variables in a regression model. The VIF is calculated based on the coefficient of determination (R^2) of the regression of each independent variable against the other independent variables.

Tabel 4. Multikolinieritas Test

	X1	X2	X3
X1	1.000	0.551	0.615
X2	0.551	1.000	0.664
X3	0.615	0.664	1.000

Source: Eviews Data Processing Results (2025)

Based on Table 4 above, considering that all correlation values are less than 0.80, it can be concluded that there are no serious multicollinearity issues among the independent variables in this model. Therefore, the regression model used meets the classical assumptions and is suitable for further analysis.

Heteroscedasticity Test

The heteroscedasticity test aims to determine whether the residual variances between observations are unequal in the regression model. If the residual variances are not constant, the model suffers from heteroscedasticity, which can result in inefficient Ordinary Least Squares (OLS) estimation results, although they remain unbiased. *Wooldridge, (2010)*.

Tabel 5. Heteroskedastisitas Test

Variabel	Coefficient	Std.error	t-static	Prob
C	30893.7	121929.4	0.25337	0.801
X1	0.00112	0.001290	0.87335	0.387
X2	-54.0220	1629.079	-0.03316	0.973
X3	-1492.124	1486.549	-1.00375	0.320

Source: Eviews Data Processing Results (2025)

Based on the test results, it is known that the probability values for all independent variables are greater than 0.05. Therefore, it can be concluded that the regression model does not contain symptoms of heteroscedasticity, so the classical assumption regarding equality of residual variances has been met.

Hypothesis Test Results

Partial Test (t)

The t-test aims to identify whether each independent variable has a partial effect on the dependent variable (poverty). The following hypotheses were tested:

Tabel 6. Parsial (t) Test

Variabel	Coefficient	Std.error	t-static	Prob
C	-3007201	276496.0	-10.87611	0.000
PMDN	0.006383	0.002925	2.182076	0.000
IPM	47872.81	3694.217	12.95885	0.000
TPT	-1022.310	3371.007	-0.303265	0.763

Source: Eviews Data Processing Results (2025)

Based on Table 6 above, the results of the partial test or t-test are as follows:

1. The Domestic Investment (PMDN) variable has a t-statistic of 2.182076 with a probability of 0.0342 (<0.05). This indicates that PMDN investment has a significant effect on poverty, so H_0 is rejected and H_1 is accepted.
2. The Human Development Index (HDI) variable has a t-statistic of 12.95885 with a probability of 0.0000 (<0.05). This indicates that HDI has a significant effect on poverty, so H_0 is rejected and H_2 is accepted.
3. The Unemployment Rate (TPT) variable has a t-statistic of -0.303265 with a probability of 0.7631 (>0.05). This indicates that TPT does not have a significant effect on poverty, so H_0 is accepted and H_3 is rejected.

Simultaneous (F)

The F-test aims to identify whether the independent variables as a whole have a significant influence on the dependent variable (poverty). The following hypotheses are tested:

Tabel 7. Simultan (F) Test

F-statistic	146.6311
Prob (F-statistic)	0.00000

Source: Eviews Data Processing Results (2025)

Based on Table 7 above, the results show an F-statistic value of 146.6311 with a probability of 0.000000, which is smaller than the significance level of 0.05. Thus, it can be concluded that the independent variables (PMDN Investment, HDI, and TPT) simultaneously have a significant effect on the dependent variable (Poverty), so that H_0 is rejected and H_4 is accepted.

Coefficient of Determination (R²) Test

The coefficient of determination (R²) is a statistical measure that indicates how much an independent variable can explain variation in the dependent variable. A high R² value indicates that the regression model has a better ability to explain changes in the dependent variable compared to a model with a low R² value Chicco et al., (2021).

Tabel 8. Koefisien Determinasi (R²) Test

Cross-sctn Fixed (Dummy Variabel)	
R-squared	0.966317
Adjust R-squared	0.959727

Source: Eviews Data Processing Results (2025)

Based on Table 8 above, the Adjusted R-squared value is 0.959727. This indicates that the contribution of PMDN Investment, HDI, and TPT to poverty is 95.97%, while the remaining 4.03% is explained by other variables outside the research model.

DISCUSSION

The Influence of Domestic Investment (PMDN) on Poverty

The finding that Domestic Investment (PMDN) has a positive and significant influence on the poverty line indicates that increasing investment actually correlates with rising poverty in Riau Islands Province. This paradoxical result is explained by the extremely uneven spatial distribution of investment, which is heavily concentrated in Batam City as the primary growth pole, while archipelagic hinterland areas such as Anambas, Natuna, Lingga, and Karimun remain largely untouched by domestic capital flows. The investment entering the region is predominantly capital-intensive, focused on industrial estates in Batam, rather than labor-intensive sectors that could absorb local workers in marine-based industries. This reinforces Myrdal's (1957) concept of backwash effects, where capital and skilled labor are drawn from peripheral areas to growth centers, weakening local economies. As Piecesa, (2023) noted, when investment is absorbed in capital-intensive sectors, its impact on employment becomes limited and does not automatically reduce poverty.

The Influence of Human Development Index (HDI) on Poverty

The finding that HDI has a positive and significant influence on the poverty line reveals that improvements in human development quality actually correspond with rising poverty, suggesting unequal distribution of development benefits. Aggregate provincial HDI improvements mask significant disparities between urban areas and island regencies, where the benefits of human development are concentrated in Batam and Tanjungpinang, while communities in island regencies face persistent limitations in accessing quality public services. This aligns with Wahyuni et al., (2022), who found that coastal communities face disparities in access to quality education and health facilities. In Sen, (2000) capabilities approach, poverty is not merely low income but also limited capabilities to access resources and participate in economic activities. Coastal communities dependent on marine-based economies do not benefit from HDI improvements occurring in urban areas, while rising living costs push the poverty line higher.

The Influence of Open Unemployment Rate (TPT) on Poverty

The finding that TPT has no significant influence on the poverty line contradicts general economic theory but aligns with archipelagic region characteristics. This insignificance is explained by the dominance of the informal sector and marine-based economic structures not captured in formal unemployment statistics. Coastal communities and traditional fishermen maintain income sources even though not recorded in the formal labor force, so TPT fluctuations do not directly impact poverty. Fishermen sell their catch to middlemen who export directly to Singapore through traditional trade routes, providing market certainty although income fluctuates. As Bonnet et al., (2019) explained, informal sector dominance in island regions creates alternative economic resilience mechanisms not captured in formal statistics. This finding is consistent with Suhesti, (2023) in Bangka Belitung, who found unemployment has an insignificant effect on poverty due to informal sector dominance.

Simultaneous Influence of PMDN, HDI, and TPT on Poverty

The simultaneous significant influence of these variables confirms that poverty in archipelagic regions requires a comprehensive approach integrating investment policy, human development, and understanding of informal sector dynamics. This reinforces Nurkse's (1953) Vicious Circle of Poverty theory, where poverty is a cycle arising from mutually reinforcing factors of low productivity, low income, low savings, and low investment. In Riau Islands Province, concentrated capital-intensive investment without equitable distribution to marine-based productive sectors fails to break this cycle and may reinforce it through backwash effects. As Perroux (1955) and Friedmann (1967) explained, poverty in peripheral areas is structural, where these areas provide resources for growth centers but do not gain adequate access to development outcomes. The findings affirm that poverty alleviation requires a multi-stakeholder approach integrating government, private sector, and communities, aligned with the RPJMD 2025-2029 focus on equitable investment distribution, balance between

capital-intensive and marine-based labor-intensive investment, and strengthening the marine economic value chain.

CONCLUSIONS AND RECOMMENDATIONS

Based on the panel data regression analysis examining the influence of Domestic Investment (PMDN), Human Development Index (HDI), and Open Unemployment Rate (TPT) on the poverty line in Riau Islands Province during the 2017-2024 period, the following conclusions answer the research questions:

First, Domestic Investment (PMDN) has a positive and significant influence on the poverty line. This indicates that increasing domestic investment has not been effective in reducing poverty; instead, it tends to drive the poverty line higher due to extreme spatial inequality where investment is concentrated in Batam (dominating over 85% of total provincial investment) and is capital-intensive in nature, failing to reach marine-based productive sectors in hinterland areas such as Anambas, Natuna, Lingga, and Karimun.

Second, the Human Development Index (HDI) has a positive and significant influence on the poverty line. This reflects unequal access to human development outcomes, where improvements in education, health, and living standards are enjoyed more by urban communities in Batam and Tanjungpinang, while coastal communities in island regencies still face limited access to quality public services. The rising cost of living accompanying HDI increases in urban areas pushes the poverty line higher without corresponding real income improvements for the poor.

Third, the Open Unemployment Rate (TPT) has no significant influence on the poverty line. This confirms that the relationship between formal unemployment and poverty is not linear in archipelagic regions due to the dominance of the informal sector and marine-based economic structures not captured in formal unemployment statistics. Coastal communities maintain income sources through traditional fishing and trade networks with Singapore, despite not being recorded in the formal labor force.

Fourth, simultaneously, PMDN, HDI, and TPT have a significant influence on the poverty line with a coefficient of determination of 95.97 percent. This confirms that poverty in Riau Islands Province is a multidimensional issue requiring comprehensive multi-stakeholder interventions integrating investment policies, human development programs, and understanding of informal sector dynamics to effectively address poverty in coastal communities.

Recommendations

Based on the research findings, the following recommendations are proposed:

For Regional Government of Riau Islands Province:

The Investment and One-Stop Integrated Services Office (DPMPTSP) should design incentive schemes that encourage investment in labor-intensive sectors, particularly marine-based industries, to reach hinterland areas such as Anambas, Natuna, Lingga, and Karimun. The Industry and Trade Office (Disperindag) and Marine and Fisheries Office (DKP) need to synergize in strengthening the marine economic value chain, improving market access for

traditional fishermen, and ensuring that added value benefits coastal communities. The Education Office (Disdik) and Health Office (Dinkes) must ensure HDI improvement programs reach all areas equitably by revitalizing public facilities in island regencies to meet urban standards and improving education relevance to local economic potential.

For Future Research:

Future studies should employ economic sociology approaches to deeply understand coastal communities' economic behavior, cultural adaptation patterns, and power relations in marine product distribution chains. Research on blue economy integrating environmental sustainability, development of environmentally friendly marine industries, and increasing added value of fishery products through downstream processing is needed. Participatory approaches involving local communities in formulating poverty alleviation solutions that align with local wisdom and traditional livelihoods are also recommended.

FURTHER STUDY

This study has several limitations that can serve as opportunities for future research. First, the quantitative approach used is limited to macroeconomic variables (PMDN, HDI, and TPT), so it cannot capture the complex socio-cultural dimensions of poverty in coastal communities. Future research should employ economic sociology or anthropological approaches to deeply understand the economic behavior of coastal communities, cultural adaptation patterns of the Orang Laut, and power relations in the marine product distribution chain between fishermen, middlemen, and exporters to Singapore.

Second, this study is limited to the 2017-2024 period and seven districts/cities in Riau Islands Province. Future research could extend the observation period and compare with other archipelagic provinces such as Bangka Belitung or Maluku to obtain more comprehensive results about poverty dynamics in island regions.

Third, the great potential of Riau Islands Province in the marine sector encourages the need for in-depth study of the blue economy that integrates environmental sustainability aspects, development of environmentally friendly marine industries, and increasing added value of fishery products through downstream processing and strengthening export market access.

Fourth, future research is expected to explore more deeply the potential of coastal communities and the Orang Laut as subjects of development, not merely objects of policy, with participatory approaches involving local communities in formulating poverty alleviation solutions that align with local wisdom and their traditional livelihoods. Qualitative studies are needed to understand why HDI improvements have not been evenly distributed and why capital-intensive investment dominates in the region.

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