Determinants of Gross Regional Domestic Product (GRDP) in Berau Regency

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Keywords:	Abstract
Human Development Index, Population Growth, GRDP, Economic Growth	This study aims to analyze the influence of the Human Development Index (HDI) and population size on the Gross Regional Domestic Product (GRDP) in Berau Regency. Economic growth, as reflected by GRDP, serves as a key indicator of regional development and is shaped by both human capital and demographic dynamics. HDI includes essential components such as education, health, and standard of living, which collectively reflect the quality of human resources. Meanwhile, population size is closely related to labor availability and consumption potential, both of which contribute to regional economic performance. This research utilizes secondary data sourced from the Central Bureau of Statistics (BPS) of Berau Regency covering the period from 2016 to 2022. Multiple linear regression analysis is employed to assess the relationship between the variables. The results reveal that the F-calculated value (14.578) exceeds the F-table value (6.94), indicating that HDI and population size simultaneously have a statistically significant effect on GRDP. Additionally, the significance value of 0.015—being less than the 0.05 threshold—confirms that both variables positively and significantly influence regional economic output. Based on these findings, it is recommended that local government authorities formulate strategic development policies that focus on enhancing the Human Development Index and maximizing the economic benefits of population growth to promote sustainable development. However, this study is limited by the use of only two independent variables and data confined to a single region and time frame, which may restrict the generalizability of the findings. Future research should consider incorporating additional variables, such as labor force participation, investment, or technological advancement, and expanding the geographical scope to provide more comprehensive insights.

1. Introduction

Economic growth is a key indicator of regional development and is commonly measured using the Gross Regional Domestic Product (GRDP), which reflects the total value of goods and services produced within a specific area over a given period. GRDP is influenced by various factors, particularly the Human Development Index (HDI) and population size. The interaction between human capital and demographic dynamics plays a critical role in shaping a region's economic performance.

Berau Regency, located in East Kalimantan Province, has undergone significant economic transformations in recent years, particularly in response to national infrastructure development and regional autonomy policies. As one of the regions projected to benefit from the development of the new capital city (IKN), Berau faces growing pressures and opportunities to optimize its economic potential. In this context, understanding the contribution of HDI and population size becomes crucial.

The HDI, which includes indicators of health, education, and standard of living, serves as a comprehensive measure of human welfare and potential. In Berau, disparities in access to quality education and healthcare remain challenges that may hinder sustainable development. Improving HDI is not only essential for enhancing individual well-being but also for strengthening the human capital needed to support long-term economic resilience.

Meanwhile, Berau's population has experienced steady growth, impacting labor supply, urban development, and consumption patterns. While a growing population can drive regional economic expansion, it can also strain

resources and infrastructure if not accompanied by proper planning. Therefore, evaluating the economic implications of population size is essential for ensuring balanced and inclusive growth.

Analyzing the influence of HDI and population size on GRDP in Berau Regency is vital for formulating development policies that are evidence-based, context-sensitive, and sustainable. This study aims to examine how these two variables affect the economic performance of Berau Regency over the period 2016–2022, providing empirical insights through statistical analysis.

Previous research has highlighted the strong link between human development and economic growth. Todaro and Smith (2015) argue that HDI is a vital determinant of long-term economic progress, as it reflects the quality of human capital. A high HDI typically correlates with a more productive, educated, and healthier population. Similarly, Mankiw (2014) notes that population growth can positively impact economic output by expanding the labor force and increasing domestic demand, though it may also pose challenges if not accompanied by adequate infrastructure and employment opportunities.

Empirical studies in Indonesia have further reinforced these relationships. Sari and Nugroho (2020) found that HDI components, especially education and health, significantly influence GRDP across various provinces. Likewise, Putra (2019) demonstrated that well-managed population growth can support regional productivity.

Despite these findings, limited research has explored these dynamics specifically in the context of Berau Regency, a region with strategic importance in East Kalimantan's economic landscape. Therefore, this study seeks to fill that gap by investigating the relationship between HDI, population size, and GRDP, and by offering insights to support inclusive and human-centered economic development strategies at the regional level.

2. Literature Review

This section reviews the theoretical and empirical literature related to the variables studied, namely Gross Regional Domestic Product (GRDP), Human Development Index (HDI), and population size. Understanding the conceptual foundations and previous research findings related to these variables is essential to explain their potential interrelationships and impacts on regional economic performance.

2.1 Gross Regional Domestic Product (GRDP)

Gross Regional Domestic Product (GRDP) is a standard economic indicator used to measure the economic performance of a specific region. It represents the total value of goods and services produced in a particular area over a specific period and is considered one of the key benchmarks for assessing regional development (Sukirno, 2006). GRDP can be measured using three approaches: the production approach, the income approach, and the expenditure approach.

The production approach calculates GRDP as the total output value minus intermediate consumption, resulting in the gross value added of all economic sectors. The income approach measures the income earned by factors of production, such as wages, interest, rent, and profits. The expenditure approach assesses total spending on final goods and services produced in the region. GRDP data are often used by regional governments to monitor economic progress, allocate resources, and plan development programs.

2.2 Human Development Index (HDI)

The Human Development Index (HDI) is a composite measure developed by the United Nations Development Programme (UNDP) to assess the level of human development in a region or country. It integrates three essential dimensions: life expectancy (health), educational attainment (education), and gross national income per capita (standard of living) (Todaro, 2006).

HDI serves as an important indicator of the quality of human capital, which is considered a key driver of economic productivity. Regions with higher HDI values typically have healthier, more educated populations with better access to economic opportunities. Previous studies have consistently shown a positive relationship between HDI and economic growth. For instance, improvements in education and health outcomes contribute to a more productive labor force, which in turn enhances GRDP.

2.3 Population Size

Population size refers to the total number of people residing in a particular region at a given time. It is a key demographic factor that significantly affects economic development. According to Mulyadi (2008), population dynamics influence both the supply and demand sides of the economy. A growing population can expand the labor force and stimulate domestic demand, which supports economic output.

However, rapid population growth without adequate planning can strain public services, infrastructure, and employment opportunities, potentially hindering sustainable development (Sukirno, 2006). The relationship between population size and GRDP is thus complex, depending on how well population growth is managed and aligned with regional development strategies.
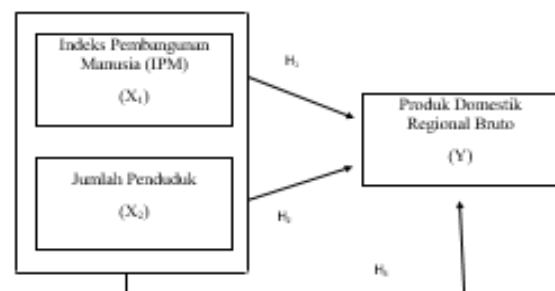
2.4 Synthesis

In summary, GRDP is a vital indicator of regional economic performance and is influenced by both human capital (HDI) and demographic factors (population size). Higher HDI contributes to a more productive and innovative workforce, while population size affects labor availability and consumption. Understanding the interplay among these variables is essential for policymakers seeking to promote sustainable and inclusive economic growth, particularly in developing regions such as Berau Regency.

3. Research Methods

This study employs a quantitative research approach to examine the influence of the Human Development Index (HDI) and Population Size on the Gross Regional Domestic Product (GRDP) in Berau Regency. The research uses secondary data sourced from the Central Bureau of Statistics (BPS) of Berau Regency, covering the period from 2016 to 2022.

The analytical method used is multiple linear regression analysis, which aims to determine the simultaneous and partial effects of the independent variables on the dependent variable. The data were processed using statistical software to generate values for F-statistics, t-statistics, and significance levels. The Analysis was conducted using statistical software (SPSS) to ensure accuracy and efficiency.

This methodological approach enables the researcher to assess the empirical relationship between human development, population dynamics, and regional economic performance in Berau Regency.

4. Results and Discussion

This section presents the empirical findings from the multiple linear regression analysis and provides a comprehensive interpretation of the relationship between the Human Development Index (HDI), population size, and Gross Regional Domestic Product (GRDP) in Berau Regency over the period 2016–2022. The discussion is structured around each independent variable and their theoretical implications.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,017	2	,008	14,911	,014[b]
	Residual	,002	4	,001		
	Total	,019	6			

a. Dependent Variable: PDRB

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2,391	4,059		,589	,587
	IPM	2,307	1,420	,491	1,624	,180
	Jumlah Penduduk	,388	,238	,493	1,630	,178

a. Dependent Variable: PDRB

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,939[a]	,882	,823	,02375

a. Predictors: (Constant), Jumlah Penduduk, IPM

4.1 The Relationship Between Human Development Index (HDI) and GRDP

Based on the regression output, the Human Development Index (HDI) variable yielded a significance value of 0.180, which is greater than the 5% significance level ($\alpha = 0.05$). This result implies that HDI does not have a statistically significant partial effect on GRDP in Berau Regency during the observed period.

This finding may be attributed to the lag effect often associated with improvements in human capital. As HDI encapsulates long-term investments in health, education, and living standards, the economic returns of such investments typically manifest over extended periods. For instance, an increase in school enrollment rates or life expectancy will not immediately translate into higher productivity or income levels. These improvements may take several years to influence labor market outcomes and economic growth (Todaro & Smith, 2015).

Moreover, the current economic structure of Berau Regency, which remains predominantly reliant on primary sectors such as agriculture and mining, may limit the short-term economic impact of human development advancements. These sectors are typically capital-intensive rather than labor-intensive, and thus less dependent on highly educated or skilled labor. Consequently, although human development is progressing, its effect on regional economic output is not yet observable in the short term.

The results are consistent with previous findings in similar regional contexts. For example, Sari and Nugroho (2020) observed that the impact of HDI on GRDP is more significant in regions transitioning toward industrial or service-based economies. Therefore, while HDI remains a critical component of long-term economic development, its short-term influence on GRDP in Berau Regency appears limited under the existing economic configuration.

4.2 The Relationship Between Population Size and GRDP

The analysis also reveals that the population size variable has a significance value of 0.178, which again exceeds the 5% significance threshold. This result indicates that population size does not have a statistically significant partial effect on the GRDP of Berau Regency during the 2016–2022 period.

This finding may reflect several structural issues within the region. Although population growth has the potential to increase the labor supply and stimulate aggregate demand, these advantages are contingent upon effective labor market absorption, income equality, and infrastructure readiness. In Berau Regency, a substantial portion of the population remains employed in the informal sector or is economically inactive, resulting in low productivity per capita. In addition, income inequality persists, limiting the capacity of population growth to contribute meaningfully to consumption-driven economic expansion.

Furthermore, infrastructural constraints, particularly in remote or underdeveloped areas, restrict the mobility and connectivity needed to fully leverage demographic advantages. Without equitable access to education, health services, and

employment opportunities, a growing population may pose more of a developmental challenge than an economic asset.

These findings are consistent with prior research. For example, Ghuroffuzumar (2021) found that population size did not significantly influence GRDP in the Special Region of Yogyakarta, largely due to underemployment and regional disparities. The implication is that demographic expansion alone is insufficient to drive economic growth unless it is supported by inclusive policies that ensure productive employment, equitable income distribution, and access to infrastructure.

4.3 Implications and Theoretical Reflections

The insignificant partial effects of both HDI and population size suggest that contextual and structural factors play a crucial role in mediating the impact of these variables on economic outcomes. This supports the argument in endogenous growth theory that while human capital and labor are essential, institutional quality, technological adaptation, and structural transformation are equally necessary for sustained economic growth (Romer, 1994; Barro, 1997).

For policymakers, this underlines the need for a more integrated development strategy that goes beyond investing in human development and managing population growth. It requires complementary measures such as industrial diversification, rural infrastructure development, and inclusive labor market policies to ensure that improvements in HDI and demographic trends can be effectively translated into measurable economic gains.

5. Closing
5.1 Conclusion

1. This study aimed to analyze the influence of the Human Development Index (HDI) and population size on the Gross Regional Domestic Product (GRDP) in Berau Regency during the period 2016–2022. The findings indicate that neither HDI nor population size has a statistically significant partial effect on GRDP. However, when analyzed simultaneously, both variables exert a significant combined influence on regional economic performance.

2. These results highlight the importance of adopting a holistic perspective when evaluating the drivers of regional economic growth. From a theoretical standpoint, this study reinforces the endogenous growth theory, which posits that economic development is closely linked to internal factors such as human capital and demographic resources. While these variables may not independently yield immediate economic effects, their synergy supports long-term productivity and growth. This emphasizes the need for integrated development strategies that simultaneously enhance both the quality of human capital and the productive potential of population growth.

5.2 Suggestion

1. **Policy Implications for Local Government**
Local governments should formulate integrated policies that prioritize human development investments—especially in education, health, and workforce empowerment programs. These policies will enhance the productive capacity of human capital and, in the long run, contribute to regional economic resilience. Furthermore, strengthening institutional capacity to manage population dynamics is essential for ensuring that demographic trends yield positive economic outcomes.

2. **Comprehensive Population Management**
As population size continues to rise, local authorities are encouraged to develop comprehensive population management strategies. These should include improving labor market efficiency, investing in infrastructure, and ensuring access to quality public services. These measures will allow the region to better harness the demographic dividend and support inclusive economic growth.

3. Recommendations for Future Research

To deepen the understanding of regional economic performance, future research should expand the analytical framework by incorporating additional variables such as investment levels, technological innovation, employment structure, and infrastructure development. Additionally, exploring the moderating or mediating role of governance quality could offer new theoretical insights. Employing mixed-methods or panel data across multiple regions would also enhance the generalizability and depth of future studies.

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