



# Analysis of the Impact of Dependency Ratio, Human Development Index, and Labor Force Participation Rate on Economic Growth in the Bangka Belitung Islands Province

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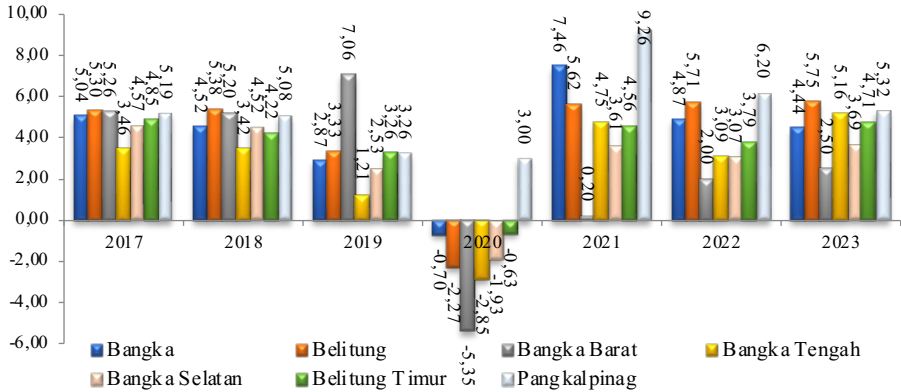
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**Abstract.** This study seeks to investigate the impact of the Dependency Ratio, Human Development Index, and Labor Force Participation Rate on Economic Growth in the Bangka Belitung Islands Province over the period from 2017 to 2023. Adopting a quantitative approach, the research utilizes secondary data. Panel data regression is employed as the analytical technique, with the optimal model chosen through the Random Effect Model (REM). Partial analysis indicates that both the Dependency Ratio and HDI have a positive effect on Economic Growth in Bangka Belitung Islands Province. Conversely, LFPR demonstrates insignificant effect on Economic Growth in this region. Nonetheless, when analyzed collectively, DR, HDI, and LFPR are found to influence Economic Growth in the Bangka Belitung Islands Province.

**Keywords:** Economic Growth, Dependency Ratio, Human Development Index, and Labor Force Participation Rate.

## 1 Introduction

Economic growth is a key indicator that reflects the increase in economic activity within a region, involving various sectors such as industry, agriculture, and services. In his research, Leasiwal [1] defines economic growth as the rise in the value and volume of goods and services produced, measured by indicators such as national income, per capita income, and the reduction of poverty levels [1]. The success of regional development is often reflected in its economic growth. Therefore, regions set high economic growth targets in their development planning. One of the important indicators for assessing a region's economic condition is the Gross Regional Domestic Product (GRDP), which reflects the region's ability to manage and utilize its resources effectively [2].



**Fig. 1.** The Growth of Gross Regional Domestic Product at Constant Prices (GRDP) of the Bangka Belitung Islands Province by Regency/City for the Years 2017–2023 (Percent)

GRDP growth at Constant Prices (ADHK) in the Bangka Belitung Islands Province, analyzed by Regency/City over a seven-year period, generally displays a fluctuating trend. In 2020, there was a significant decline of 2.29% compared to the previous year. The highest annual GRDP growth percentage was in Pangkalpinang City in 2021, while the lowest annual GRDP growth percentage was in West Bangka Regency in 2020.

These fluctuations in GRDP growth across regencies/cities are due to demographic changes, such as income levels, health, education, and labor productivity [3]. A demographic bonus, this situation, where the working-age population exceeds the non-working-age population, can be measured using the Dependency Ratio. A low Dependency Ratio contributes to economic growth by increasing savings and investments necessary for capital accumulation and labor productivity improvement [4].

According to Neo-Classical Economic Growth Theory, the dependency ratio influences economic growth. In the Solow growth model, a high dependency ratio is considered to hinder economic growth by reducing savings and investments needed for capital accumulation and increased labor productivity. A high dependency ratio means more non-productive population (<15 years and >64 years) compared to the productive age population, which lowers aggregate savings because the non-productive population consumes more than they save. With low savings, limited investment occurs, hindering capital accumulation and productivity, thus slowing long-term economic growth [5].

This is consistent with research by Nasution [6] and Hermawan [7], which shows that the demographic bonus has a significant impact on economic growth, with the age dependency ratio negatively affecting economic growth. This means that the higher the age dependency ratio growth rate, the more negative its impact on economic growth. Additionally, high economic growth increases economic capacity, creates new jobs, raises per capita income, and boosts both demand and supply, all contributing to economic growth [6], [7].

The Human Development Index (HDI) is an important indicator for evaluating the quality of life of a population, including aspects such as life expectancy, education, and

a decent standard of living [8]. Data from BPS Bangka Belitung (2024) shows that the HDI increased significantly in 2023, reaching 74.34. This increase in HDI reflects progress in education, health, and living standards, demonstrating the government's commitment to improving quality of life. The rise in HDI also indicates significant human development progress in the region.

According to the Human Development Theory developed by Amartya Sen, non-economic factors such as health, education, and individual freedom are important for economic growth. This theory emphasizes that improving human well-being, measured through HDI, can contribute to sustainable economic growth. Investments in aspects of human well-being, such as health, education, and individual freedom, can enhance productivity and the economic capacity of a country in the long run [8]. This is in line with research by Isnaini, Nur Sarviah, & Dwi Ratnasari and Taqi, Ali, Parveen, Babar, & Khan, which state that HDI has a positive and significant impact on economic growth [9] [10].

Labor is a crucial factor in the economic growth process, especially during the demographic bonus when the number of working-age individuals exceeds the non-working population [11]. LFPR in the Bangka Belitung Islands Province showed fluctuations during the 2017 to 2023 period. The highest LFPR in province by regency/city was in East Belitung Regency in 2018, with a rate of 71.93%. Meanwhile, the lowest LFPR was in Pangkalpinang City in 2020, with a rate of 62.37% [12].

According to Classical Theory, several factors influence economic growth, including capital goods, labor, technology, money, and management. This theory explains the Law of Diminishing Returns, which suggests that not all populations can be involved in the production process, and forcing this will reduce the economy's output level [13]. This is consistent with research by Purba and Putriana & Aji, which state that LFPR has a positive and significant influence on economic growth [14], [15].

This study aims to investigate the effects of the Dependency Ratio, HDI, and LFPR on economic growth in the Bangka Belitung Islands Province. By understanding how to utilize the Dependency Ratio and enhance quality of life and workforce standards, this study is anticipated to offer policy recommendations to foster sustainable economic growth in the region. Additionally, the findings can serve as a reference for other regions in Indonesia experiencing a demographic dividend, offering guidance for policies on job creation, human resource development, and managing the working-age population.

## 2 Research Method

This study examines the impact of the DR, HDI, and LFPR on Economic Growth, using GRDP for the Bangka Belitung Islands Province. The research covers seven regencies/cities. Quantitative data, sourced from secondary sources, is used in the study, specifically numerical data. Data collection methods include literature review, documentation, and library research. This data was gathered through visits to the websites of Indonesia's Central Statistics Agency (BPS) and the Bangka Belitung Provincial Statistics Agency (BPS), followed by a review of relevant resources.

This research utilizes Multiple Regression Analysis as its analytical method, employing panel data that combines both cross-sectional and time series data. The analysis is conducted using E-Views software. This technique is useful for understanding the impact of independent variables on the dependent variable in the context of panel data and can provide valuable insights in various fields, including economics, finance, and social sciences [16].

In this research, the linear regression equation model to be estimated is as follows:

$$EG_{it} = \alpha + \beta_1 DR_{it} + \beta_2 HDI_{it} + \beta_3 LFPR_{it} + e_{it} \tag{1}$$

Explanation:

EG = Economic Growth, DR = Dependency Ratio, HDI = Human Development Index, LFPR = Labor Force Participation Rate,  $\alpha$  = Constant,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  = Regression Coefficients,  $i$  = Number of regions (7 regencies/cities in the Bangka Belitung Islands Province),  $t$  = Research period (from 2017 to 2023),  $e$  = Error term.

### 3 Results and Discussion

#### 3.1 Economic Growth Trends in the Bangka Belitung Islands Province

Trends in economic growth can be analyzed through the Gross Regional Domestic Product (GRDP) data of the seven regencies/cities in the Bangka Belitung Islands Province from 2017 to 2023. This can be illustrated in the following figure:

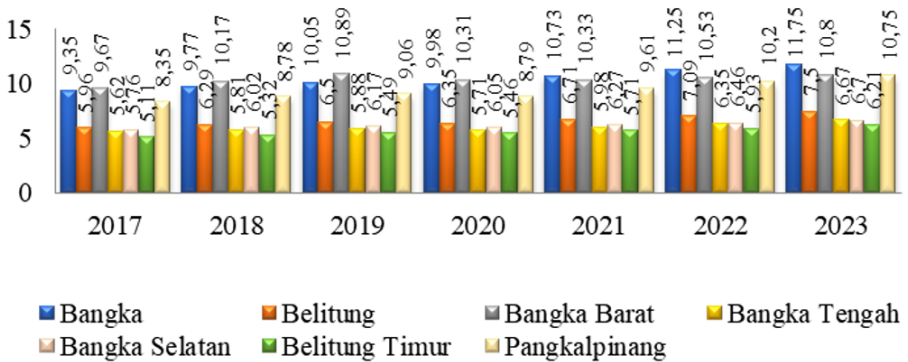


Fig. 2. Economic Growth Trends in Regencies/Cities of the Bangka Belitung Islands Province from 2017 to 2023 (in million rupiah).

As shown in Figure 1, the economic growth trends, proxied by GRDP data, in Bangka Belitung Islands Province from 2017 to 2023 have fluctuated. On average, Bangka Regency experienced the highest economic growth during the observation period, with a rate of 10.42 million rupiah. The second highest was West Bangka Regency, with a growth rate of 10.39 million rupiah. This was followed by Pangkalpinang City, with

4.12-million-rupiah, Belitung Regency with 6.63-million-rupiah, South Bangka Regency in fifth place with 6.21 million-rupiah, Central Bangka Regency in sixth with 6.01 million rupiah, and lastly, East Belitung Regency with 5.61 million rupiah.

### 3.2 Descriptive Statistics Results

Here are the results of the calculation of the Regional Sustainable Development Index (RSDI) in the Sumatra Region Provinces from 2018 to 2023:

**Table 1.** Calculation Results of the Regional Sustainable Development Index (RSDI) in the Sumatra Region Provinces, 2018-2023

Variabel	Mean	Standar Deviation	Minimum	Maksimum
LOG(EG)	15.83591.	0.263288.	15.44677.	16.27989.
DR	43.88735	2.531301	39.02000	47.78000
HDI	71.75633	3.500431	65.02000	80.45000
LFPR	67.59959	2.146423	62.37000	71.93000

The results in Table 1 show that economic growth has a mean value of 15.83591, indicating that the average contribution is 15.83591 percent. The max value is 16.27989 percent, and the min value is 15.44677 percent. Standard Deviation is 0.263288, which means that the maximum increase from the average economic growth in the seven regencies/cities is +0.263288, while the maximum decrease is -0.263288. In other words, the average deviation of the economic growth variable across the regencies/cities in the Bangka Belitung Islands Province is 0.26 percent.

### 3.3 Results of the Linear Regression Model Equation

The analysis indicates that the Random Effect Model (REM) is the most appropriate approach for this study. According to Table 2, the regression model shows an economic growth coefficient of 11.61075, suggesting that, in the absence of the independent variables—Dependency Ratio, HDI, and LFPR—economic growth would be 11.61075 percent. The regression coefficient for the Dependency Ratio is 0.006964, reflecting significant effect; a 1 percent increase in the Dependency Ratio would raise economic growth by 0.006964 percent. Similarly, the HDI has a regression coefficient of 0.054944, indicating significant effect, where a 1 percent increase in this index results in a 0.054944 percent increase in economic growth. Conversely, the LFPR has a regression coefficient of -0.000341, which suggests a negative and insignificant effect, with a 1 percent increase in the Labor Force Participation Rate leading to a 0.000341 percent decrease in economic growth.

**Table 2.** Results of the Regression Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.61075	0.373450	31.09047	0.0000
DR	0.006964	0.002277	3.058887	0.0037
HDI	0.054944	0.004082	13.46108	0.0000
LFPR	-0.000341	0.002284	-0.149304	0.8820
<b>Random Effects (Cross)</b>				
R-squared	0.821023	Mean dependent var		0.757131
Adjusted R-squared	0.809091	S.D. dependent var		0.065447
F-statistic	68.80963	Durbin-Watson stat		1.514056

The t-test results that the Dependency Ratio has and significant effect on economic growth in the Bangka Belitung Islands Province, with a calculated t-value exceeding the critical t-value ( $3.058887 > 2.0141$ ). This leads to the rejection of the null hypothesis ( $H_0$ ) and the acceptance of the alternative hypothesis ( $H_1$ ). Similarly, the HDI also has significant impact on economic growth, with a t-value of 13.46108, which is greater than the critical t-value ( $13.46108 > 2.0141$ ), resulting again in  $H_0$  being rejected and  $H_1$  accepted. Conversely, the LFPR demonstrates insignificant effect on economic growth, with a t-value of -0.149304, which is less than the critical t-value ( $-0.149304 < 2.0141$ ); thus,  $H_0$  is acc, and  $H_1$  is rejected.

The F-test results suggest that the Dependency Ratio, HDI, and LFPR collectively influence economic growth in the Bangka Belitung Islands Province, as the calculated F-value is higher than the critical F-value ( $68.80963 > 2.81154$ ). Therefore,  $H_0$  is rejected, and  $H_4$  is acc.

Coefficient determination (R-squared) is 0.821023, or 82.10 percent, indicating that 82.10 percent of the variance in economic growth is explained by the variables studied: the Dependency Ratio, HDI, and LFPR. The remaining 17.90 percent is attributed to other factors not examined in this research.

## 4 Conclusions

The following recommendations are proposed for this research: 1. For the Provincial Government: The local government is encouraged to implement policies that focus on the optimal utilization of the Dependency Ratio, The government should enhance access to quality healthcare and education services, The local government is also advised to promote economic diversification to reduce dependence on capital-intensive sectors, such as mining and plantations, Policies that support the creation of more and higher-quality jobs should be implemented; 2. For Future Researchers: Future researchers are encouraged to expand or integrate relevant factors that contribute to economic growth in the Bangka Belitung Province, They should conduct evaluations of the impacts of existing economic policies implemented in Bangka Belitung. This analysis can provide insights into the effectiveness of current policies and offer recommendations for future policy improvements.

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