

## Analysis of Macroeconomic Influence on Economic Growth in Bali Province

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### Abstract

*This study analyzes the macroeconomic impact on economic growth in Bali Province using panel data regression for the 2019-2023 period. The variables studied include TPT, Gini Ratio, TPAK, and HDI on the GRDP ADHK of nine regencies/cities. The results show that all four variables have a significant simultaneous effect. Partially, TPT and Gini Ratio have a significant negative effect, and TPAK and HDI have a significant positive effect. TPAK has the largest impact on economic growth. These findings emphasize the importance of inclusive economic development through the creation of productive jobs, the improvement of human resource quality, and the reduction of income inequality.*

## INTRODUCTION

Economic growth is one of the main indicators in measuring the effectiveness of a country's development, which reflects the process of increasing output over time, as well as the increase in goods and services in society (Efendi & Aimon, 2024). One sector that plays a major role in boosting economic growth is tourism, especially in areas with major tourist attractions. Tourism is a major driver of Indonesia's regional economy. The large number of domestic and international tourists who visit each year, various economic subsectors such as hotels, transportation, culinary, local crafts, and other services experience growth (Rizki Kurniawan et al., 2024). Bali Province, as one of the main tourism destinations in Indonesia, has unique economic characteristics with a high dependence on the tourism sector. Tourism in Bali encourages investment, creates jobs, and increases regional income. This sector makes a significant contribution to Bali's Gross Regional Domestic Product as a measure of the regional economy's progress. (Ariani, 2024).

While tourism provides significant employment and boosts incomes, its benefits are often felt only in tourism hubs like Badung and Denpasar, while other regions like Karangasem and Bangli lag behind (Urbanus, 2017). Income inequality, differences in quality of life between regions, and persistently high unemployment rates indicate that economic growth is not fully equitable across regions. Bali Province's 2019-2023 GRDP (Gross Domestic Product) data from the Bali Provincial Revenue and Expenditure Index (ADHK) show significant regional disparities: Badung Regency experienced a sharp decline during the pandemic before recovering, while regions like Karangasem and Bangli showed slower growth.

To comprehensively understand the dynamics of economic growth in Bali Province, an in-depth analysis of the macroeconomic factors influencing it is necessary. The Open Unemployment Rate (TPT) reflects the capacity of the economic sector to absorb the available workforce and is an indicator of the success of economic growth. The Gini Ratio, as a measure of income inequality, provides an overview of the distribution of the benefits of economic growth across regions. The Labor Force

Participation Rate (TPAK) plays a crucial role in the context of growth, indicating the extent to which the working-age population is actively involved in economic activities. Meanwhile, the Human Development Index (HDI) reflects the quality of human resources, which is a crucial foundation for a region's economic competitiveness.

Several previous studies have examined the factors influencing GRDP. Research by (Resi, 2024) showed that the TPAK had a negative and significant effect, while the HDI and population had a positive effect on GRDP. Other research by (Sukma Wardani & Huda, 2023) emphasized the importance of the HDI and the Regional Gross Domestic Product on GRDP, while the TPAK had no significant effect. Meanwhile, (Romhadhoni et al., 2018) (Suhardi & Rival, 2024) highlighted income inequality and unemployment as factors that play a role in the dynamics of economic growth. However, most studies still focus on specific regions and limited variables.

In previous studies, there have been few studies that simultaneously analyze the influence of the Open Unemployment Rate (TPT), Gini Ratio, TPAK, and HDI on economic growth in Bali Province using the latest panel data. Therefore, this study is important to fill this gap and provide a comprehensive picture of the macroeconomic factors that influence economic growth in Bali. Based on this background, the purpose of this study is to determine the influence of the Open Unemployment Rate (TPT), Gini Ratio, TPAK, and HDI on GRDP in Bali Province. Thus, the proposed hypothesis is: There is a significant influence between the Open Unemployment Rate (TPT), Gini Ratio, TPAK, and HDI on economic growth GRDP ADHK in Bali Province. This study aims to analyze the influence of macroeconomic indicators in the form of the Open Unemployment Rate (TPT), Gini Ratio, Labor Force Participation Rate (TPAK), and Human Development Index (HDI) on economic growth in Bali Province as measured by GRDP ADHK in the period 2019-2023.

## RESEARCH METHODS

This study uses a quantitative approach with secondary panel data collected from nine regencies/cities in Bali Province during the period 2019–2023. The dependent variable in this study is Gross Regional Domestic Product at Constant Prices (GRDP ADHK), which is used as an indicator of economic growth. The independent variables consist of the open unemployment rate, the Gini ratio, the labor force participation rate, and the human development index.

The basic econometric model used in this study is a panel data regression model with the following specifications:

$$Y_{it} = \beta^0 - \beta^1 X^1 - \beta^2 X^2 + \beta^3 X^3 + \beta^4 X^4 + e_{it} \dots \dots \dots (1)$$

where  $Y_{it}$  is the ADHK GRDP as the dependent variable. The independent variables in this model include  $X_1$  (Open Unemployment Rate),  $X_2$  (Gini Ratio),  $X_3$  (Labor Force Participation Rate), and  $X_4$  (Human Development Index). The  $\beta$  coefficient indicates the influence of each variable,  $e_{it}$  is the error.

In this study, three stages of testing were used to determine the best panel data estimation model. The Chow Test was used to choose between Common Effect and Fixed Effect, the Hausman Test to compare Fixed Effect and Random Effect, and the Lagrange Multiplier Test to choose between Common Effect and Random Effect, with each decision based on the P-value (Mobonggi Dj Irma, 2022). Classical assumption tests were conducted to ensure the validity of the model, including the Multicollinearity Test with a correlation limit of 0.9 and the Heteroscedasticity Test with a residual limit of  $\pm 500$ . Model evaluation was carried out through the t-test to test the partial effect of each independent variable on the dependent variable with a

significance criterion of P-value  $\leq 0.05$ , and the F-test to determine the simultaneous effect of all independent variables on the dependent variable. Furthermore, the R<sup>2</sup> Test was used to assess the model's ability in each variable.

## RESULTS AND DISCUSSION

Bali Province is used as an object to analyze the influence of macroeconomic indicators on economic growth as measured by the GRDP ADHK for the 2019-2023 period (Gultom et al., 2023). The variables analyzed include TPT, Gini Ratio, TPAK, and HDI. The method used includes panel data analysis with model testing stages, namely the Chow Test, Hausman Test, and Breusch-Pagan, to determine the best estimation model. In addition, classical assumption tests such as multicollinearity and heteroscedasticity tests are carried out to ensure model validity, as well as statistical evaluations through the t-test, F-test, and R<sup>2</sup> test, to assess the significance and strength of the influence of independent variables on the dependent variable (Ashar, 2017).

**Table 1** Chow Test Results

Effect Test	Statistics	df	Prob.
Cross-section F	345.088761	(8.32)	0.0000
Cross-section Chi-square	201.106434	8	0.0000

Based on the results above, it is known that Prob value  $0.0000 < 0.05$ . So, the selected model is FEM.

**Table 2** Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. df	Prob.
Random cross-section	11.440680	4	0.0220

From these results, the prob value is  $0.0220 < 0.05$ . Therefore, the selected model is FEM.

**Table 3** Breusch-Pagan Test Results

	Cross-section	Time	Both
Breusch-Pagan	57.20126 (0.0000)	0.293061 (0.5883)	57.59432 (0.0000)

The Breusch -Pagan LM test with a Breusch -Pagan probability of 0.0000 ( $< 0.05$ ) shows that the Random Effect Model (REM) is more appropriate than the Common Effect Model (CEM). From the results of the Chow, Hausman, and Breusch -Pagan tests, it can be seen that in the Chow test, the FEM model is more appropriate, the Hausman FEM test is more appropriate, so it can be concluded that the best model is the FEM or Fixed Model. Effect Model.

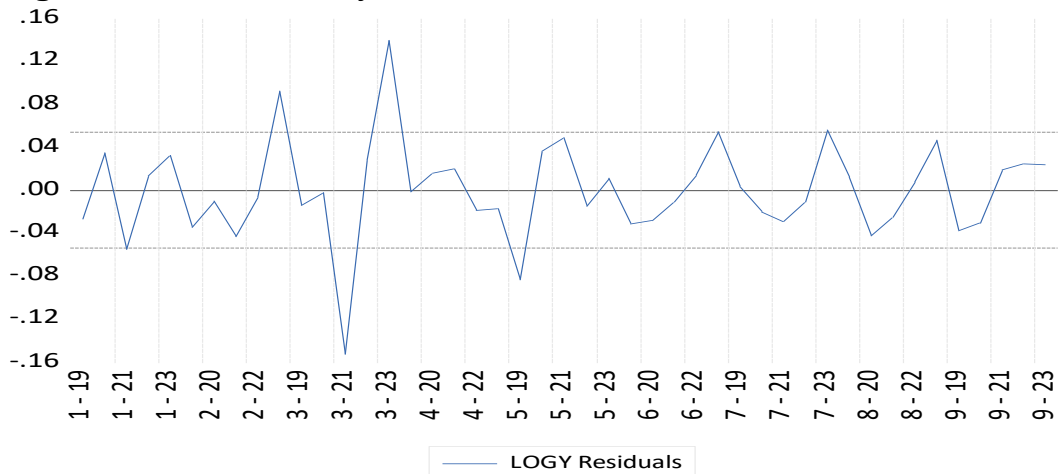
The classical assumption test in this study was conducted using two tests: a multicollinearity test aimed at detecting high correlations between independent variables and a heteroscedasticity test used to determine whether the residual variance in the model is constant (Djuli, 2021). Both tests are important to ensure the validity of the regression model before further hypothesis testing.

**Table 4** Multicollinearity Test Results

	Correlation			
	TPT (X1)	GR (X2)	TPAK(X3)	HDI (X4)
TPT (X1)	1,000,000	0.211873	-0.529749	0.297978
GR X2)	0.211873	1,000,000	-0.257854	0.375716
TPAK(X3)	0.529749	-0.257854	1,000,000	-0.688617
HDI (X4)	0.297978	0.375716	-0.688617	1,000,000

Based on the Multicollinearity Test results, obtained mark correlation between variables independent as follows: TPT and Gini Ratio of 0.211873, TPT and TPAK of -0.529749, TPT and HDI of 0.297978, Gini Ratio and TPAK of -0.257854, GN and HDI of 0.375716, and TPAK and HDI of -0.688617. Since all correlation values between these independent variables are below 0.9, it can be concluded that there is no multicollinearity in this model. Thus, this model is declared to have passed the multicollinearity test (Napitulu et al., 2021).

**Figure 1 Heteroscedasticity Test**



Based on the results of the Heteroscedasticity Test, the residual graph shows that the residual value does not exceed the limit between -500 and 500. This shows that residual variance is constant, or together with this, it can be concluded that there is no symptom heteroscedasticity in the model, so this model passes the heteroscedasticity test (Napitulu et al., 2021). Test results assumptions classic show that the research model has fulfilled conditions for multicollinearity and heteroscedasticity tests. With fulfillment assumptions, classic said, analysis can be continued to stage testing hypotheses, which includes partial test (t-test), simultaneous test (F-test), and analysis coefficient determination ( $R^2$ ) to evaluate the significant influence as well as measure how much independent variables can explain variation in dependent variables.

**Table 5 Fixed Effect Model (FEM)**

Variable	Coefficient	t-Statistic	Prob.
C	13.17457	28.63772	0.0000
TPT (X1)	-0.025413	-4.601874	0.0001
GR (X2)	-0.000110	-2.021021	0.0517*10
TPAK (X3)	7.244395	2.285198	0.0291
HDI (X4)	0.000172	3.659443	0.0000
Adj R-squared	0.995674		
F-statistic	613.7951		
Prob(F-statistic)	0.000000		

**Partial Test (T-Test)**

Statistical test for the TPT variable is  $-4.601874 > t\text{-table } 1.679427$ , while the probability is  $0.0000 < 0.1$ , which means  $H_1$  is accepted, so reject  $H_0$ , which can be interpreted in a way that TPT statistics have a significant and negative impact on

Economic Growth. Next, for the Mark coefficient of -0.025413. So, if TPT increases by 1%, then Economic growth will experience a decline by 0.025413%.

Statistical test For The Gini Ratio variable is  $-2.021021 > t\text{-table } 1.679427$ , while the probability is  $0.0674 < 0.1$ , which means  $H_1$  is accepted, so that reject  $H_0$ , which can be interpreted in a way that Gini Ratio statistics have a significant and negative to Economic Growth. Next, for the mark coefficient of -0.000110. So, if the Gini Ratio increases by 1%, then Economic growth will experience a decline by -0.00011%.

Statistical test for TPAK variable is  $2.285198 > t\text{-table } 1.679427$  while the probability is  $0.0000 < 0.1$ , which means  $H_1$  is accepted, so reject  $H_0$ , which can be interpreted statistically that the Gini Ratio has a significant and positive to Economic Growth. Next, for the mark coefficient amounting to 7.244395. So, if the Gini Ratio increases by 1%, then Economic growth will experience a decline of 7.244395.

Statistical test for the IPM variable is  $3.659443 > t\text{-table } 1.679427$ , while the probability is  $0.0005 < 0.1$ , which means  $H_1$  is accepted, so reject  $H_0$ , which can be interpreted in a way that HDI statistics have a significant and positive effect on Economic Growth. Next, for the mark coefficient amounting to 0.000172. So, if the HDI increases by 1%, then Growth The economy will experience a decline by 0.000172 %.

### **Simultaneous Test (F Test)**

The results of the F test on TPT, Gini Ratio, TPAK, and HDI obtained a Prob value (F - statistic) of  $0.000000 < 0.1$ . So the dependent variable has an effect on the independent variable. The F-statistical test is used to evaluate the simultaneous significance of the independent variables in the regression model on the dependent variable. This test is carried out at a significance level of 0.1. The results of the analysis show that the F-statistic value is  $613.7951 > f\text{-table } 2.12398$ , and the probability value is  $0.000000 < 0.1$ . Thus,  $H_0$  is rejected, and  $H_1$  is accepted, which means that simultaneously the TPT, Gini Ratio, TPAK, and HDI variables are significant to Economic Growth in Bali.

### **Coefficient of Determination Test ( $R^2$ )**

The coefficient of determination ( $R^2$ ) test is a percentage that shows how much the independent variables (Open Unemployment Rate, Gini Ratio, Labor Force Participation Rate, Human Development Index) can explain the dependent variable, namely the ADHK GRDP. The results of the determination test ( $R^2$ ) are that the greater the value, the better the results of the regression model. (Olliviya Tri Hermanda et al., 2025).

Adjusted R-squared value is 0.996305. The result is converted into a percentage, meaning the percentage contribution of the independent variable's influence on the dependent variable. Thus, the TPT, Gini Ratio, TPAK, and HDI influence and explain 99.5674% of economic growth.

## **DISCUSSION**

### **The Influence of the Open Unemployment Rate (TPT) on the ADHK GRDP**

The TPT variable on the ADHK GRDP shows a negative and significant effect. High ADHK GRDP indicates the weak absorption capacity of the economic sector towards the workforce, especially outside the tourism sector, which tends to be capital-intensive and less labor-intensive (Romhadhoni et al., 2018). This hampers regional productivity and supports the concept of Okun's Law that increasing unemployment has an impact on decreasing economic output. This finding is in line with the theory of Okun's Law, which states that there is a negative relationship between poverty levels and economic output. The high poverty rate in Bali Province

reflects the weak absorption capacity of the economic sector towards the available workforce. This condition occurs because Bali's economic structure is highly dependent on the tourism sector, which tends to be capital-intensive and less labor-intensive. When poverty levels are high, regional economic productivity declines due to the reduction in productive labor, contributing to the process of producing goods and services.

When unemployment rates are high, regional economic productivity declines due to a reduction in the productive workforce, contributing to the production of goods and services. Furthermore, high unemployment rates also create a domino effect, resulting in decreased purchasing power, reduced aggregate demand, and a weakening multiplier effect in the regional economy. This situation can exacerbate the mismatch between the skills of the workforce and the needs of the labor market, particularly in modern sectors that require specialized qualifications. Addressing this issue requires broader economic diversification beyond tourism, development of labor-intensive sectors such as the creative industry and MSMEs, and improvement of human resource quality through vocational training and education programs tailored to labor market needs.

### **The Influence of the Gini Ratio on the ADHK GRDP**

The Gini Ratio variable on the ADHK GRDP shows a negative and significant effect. This negative effect indicates that high income inequality hinders economic growth in Bali Province. The mechanism of this negative effect can be explained through spatial inequality, where unequal income distribution causes the benefits of economic growth to be concentrated only in central areas such as Badung Regency and Denpasar City, which have developed tourism and service sectors, while outlying areas such as Karangasem and Bangli, which rely on the agricultural sector, remain lagging. This inequality creates barriers to access to essential resources, with low-income communities experiencing difficulties in accessing quality education, health services, and skills training necessary for productive employment, thereby reducing the overall quality of human resources.

Furthermore, income inequality leads to weak purchasing power, with the majority of the population having low consumption capacity, resulting in declining aggregate demand and domestic consumption, ultimately hampering demand-side economic growth. Low-income communities also face limitations in investing in human capital, such as education and health, which are crucial factors for increasing long-term productivity. This finding aligns with endogenous growth theory, which emphasizes that equitable income distribution encourages human capital accumulation and technological innovation, ultimately supporting sustainable economic growth. Therefore, efforts to reduce income inequality through redistribution policies and economic development in disadvantaged regions are crucial for promoting inclusive economic growth in Bali Province.

### **The Influence of the Labor Force Participation Rate (TPAK) on GRDP ADHK**

The TPAK variable on the ADHK GRDP shows a positive and significant influence. The positive and dominant influence of TPAK on the economic growth of ADHK GRDP indicates that the more the working-age population is actively involved in economic activities, the greater its contribution to increasing regional output. This is in line with the theory of economic growth, which emphasizes the importance of the labor factor as a production input. The strong influence of TPAK indicates that active participation of the workforce is the main driver of Bali's economic growth, especially in supporting the tourism sector and other economic sectors. However,

increasing TPAK must be accompanied by improving the quality of the workforce to be able to provide optimal economic impact. Participation that is not balanced with adequate skills can actually give rise to informal jobs with low productivity (Resi, 2024).

The positive contribution of the TPAK to economic growth is also reflected in the absorption of job opportunities created by the expansion of Bali's leading economic sectors. The tourism sector, the backbone of Bali's economy, is highly dependent on the availability of an adequate workforce, spanning sectors such as accommodation, restaurants, and transportation, as well as the creative industries that support tourism. However, increasing the TPAK must be accompanied by improvements in workforce quality through education, skills training, and competency development to deliver optimal economic impact. Participation that is not balanced with adequate skills can actually lead to the dominance of informal jobs with low productivity, inadequate wages, and limited contribution to sustainable economic growth.

### **The Influence of the Human Development Index (HDI) on ADHK GRDP**

The HDI variable on the ADHK GRDP shows a positive and significant influence. The positive influence of the HDI on the economic growth of the ADHK GRDP emphasizes the importance of human resource quality in driving economic development. A high HDI reflects a good level of education, health, and standard of living, which in turn increases labor productivity and regional economic competitiveness. Regions with a high HDI, such as Denpasar and Badung, generally have a higher GRDP than regions with a low HDI. (Sukma Wardani & Huda, 2023) Investments in education and public health have been proven to provide positive returns for long-term economic growth. Quality human resources can drive innovation, increase production efficiency, and support the structural transformation of the economy from traditional sectors to more productive, modern ones.

Overall, this study confirms that Bali's economic growth cannot rely solely on the tourism sector but must also address underlying socioeconomic conditions. Reducing unemployment, equalizing income distribution, increasing labor force participation, and equitable human development are key to equitable and sustainable economic growth. Therefore, an inclusive, data-driven development strategy is needed to drive Bali's comprehensive economic transformation, ensuring that all levels of society and regions can benefit from the growth achieved.

### **CONCLUSION**

The analysis results show that the four macroeconomic indicators of TPT, Gini Ratio, TPAK, and HDI simultaneously have a significant effect on the economic growth of Bali Province as measured by the ADHK GRDP. Partially, TPT and Gini Ratio have a significant negative impact, indicating that high unemployment and income inequality hinder economic growth. Conversely, TPAK and HDI have a significant positive effect, reflecting that increasing labor force participation and quality of life through education and health contribute to sustainable growth. Among all variables, TPAK has the most dominant influence on GRDP, confirming that active labor force involvement is the main driver of Bali's economic growth. This finding emphasizes the importance of developing quality human resources and optimal absorption in the labor market as a foundation.

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