



## Determinants of Economic Growth in Bali Province

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### ABSTRACT

Economic growth is one of the goals of economic development. Sustainable economic growth has an impact on various other economic and social sectors. This research aims to see the effect of investment, regional income and human development index (HDI) on economic growth in Bali Province. Data from the BPS-Statistics Bali for 2011-2021. The statistical method used multiple linear regression with panel data. Based on panel model testing, the fixed model is the best. Simultaneously, all variables affect the rate of economic growth. Partially, investment, regional income and human development index have a significant positive effect on the economic growth rate in Bali. Based on the results of this study, comprehensive policies related to macro-social economics are needed so that the level of economic growth continues to increase sustainably).

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## 1. INTRODUCTION

Bali Province is one of the most famous provinces in Indonesia, and even the world is an attractive tourist destination. However, besides tourism potential, Bali has other growing economic sectors, such as agriculture, fisheries, and industry. However, despite its great potential, Bali's economic growth is still not comparable to its potential. Especially during the pandemic, the economy of Bali province slumped, where economic growth contracted by -9.34 percent in 2020 and -2.46 percent in 2021.

Economic growth is an essential indicator in assessing the welfare of the people of a region. High economic growth can provide benefits in the form of increased per capita income, new jobs, and increased competitiveness of an area in the global market. However, low economic growth can lead to various problems, such as unemployment, poverty, and economic instability.

One factor that can affect a region's economic growth is the quality of human resources. Human resources can increase productivity and innovation in financial sectors, thereby increasing economic growth. Measurement of the quality of human resources can be measured by the human development index (HDI). Nwaogu & Okorie (2018) and Tuck et al. (2019) stated that increasing HDI will increase economic growth.

On the other hand, regional or local income is one of the region's most important sources of revenue. High regional income can provide many benefits for an area, one of which is that it can affect economic growth. High regional income can positively impact a region's economic growth (Akbar & Kholifah, 2020). The government can allocate funds for important sectors such as infrastructure, education, and health with sufficient revenue.

Another factor that can affect economic growth is investment. Investment is a factor that significantly influences a country's economic growth (Sukirno & Nasution, 2020). Investments made by the private sector and the government can increase production, create new jobs, and improve people's income. Investment can be in the form of domestic investment or foreign investment.

Based on the background above, research on factors that affect a region's economic growth is fundamental. By knowing these factors, the government and policymakers can take appropriate actions to increase economic growth and public welfare. This study used a panel data regression model using data from city districts in Bali Province from 2011-2021.

## 2. RESEARCH METHOD

The data used in this study came from the publication of the BPS-Statistics Bali. This research focuses on all urban districts in Bali with a research period of 2011-2021. The dependent and independent variables in this study can be seen in Table 1.

Table 1. Variabel Research

Dependent Variables	Unit	Transformation
Gross Regional Domestic Product (GRDP)	Milyar	Natural logs
Independent Variables		
Domestic Investment	Trillion	Natural logs
Foreign Investment	Trillion	Natural logs
Regional Income	Billion	Natural logs
Human Development Index (HDI)	Points	-

The regression model used is panel data regression analysis. There are three types of modelling in panel data regression, namely, the common/pooled Model, fixed-effect Model, and random effect model (Baltagi, 2005). Model selection tests determine the best model that informs the relationship between variables. Panel selection tests can be seen in Table 2.

Table 2. Panel Model Selection Test<sup>2</sup>

Panel Model Test	Null Hypothesis	Alternative Hypotheses
LM BP Tests	Pooled/common model is better than Fixed	Fixed model is better than Pooled/ common model
Chow Test	Pooled/common model is better than a Random	Random model is better than Pooled/Common Model
Hausman test	A random model is better than Fixed	A fixed model is better than a Random

After selecting the best model, a classic assumption test is carried out. This test is performed to ensure that the model can be used to see the influence between variables and predict the dependent variable's value from the independent variable's known value (Gujarati, 2004). The classical assumption test can be seen in Table 3.

Table 3. Classical Assumption Test<sup>3</sup>

Assumption Test	Null Hypothesis	Alternative Hypotheses
Shapiro Wilk tests	Normally distributed data	Data is not normally distributed
Breusch-Pagan test	Homokedastis data variants	Heterokedastis data variants
Wooldridge test	Non-Autocorrelation Model	Autocorrelation Model

Once the best model has been selected and meets the classical assumptions, the next step is to test the model's goodness (Walpole, 2012). The merits of model tests can be seen in Table 4. After all the test criteria of the model are met, the interpretation of the formed regression equation is carried out.

Table 4. Model Goodness Test<sup>4</sup>

The goodness of Fit Test	Null Hypothesis	Alternative Hypotheses	Reject Ho
Test Coefficient of Determination / adjusted R square		R square > 0.5	
Simultaneous Test / F Test	Model Not fit/ All variables have no effect	Model fit / at least one variable has a significant effect	Prob. Rated < 0.05
Partial Test / T Test	Certain independent variables have no effect	Influential independent variables	Prob. Rated < 0.05

The hypotheses in this study are:

- H1: Human Development Index (HDI) has a significant effect on economic growth in Bali
- H2: Domestic Investment has a significant effect on economic growth in Bali
- H3: Foreign Direct Investment has a significant effect on economic growth in Bali
- H4: Local Original Income (PAD) has a significant effect on economic growth in Bali

### 3. RESULTS AND DISCUSSIONS

The discussion begins by using descriptive analysis to determine the characteristics of each variable in the study during the research period. Table 5 shows a descriptive analysis. The average Gross Regional Domestic Product (GRDP) was 14.79 billion, with the lowest value of 2.92 billion in Bangli Regency in 2011 and the highest of 37.33 billion in Badung City in 2019. Average Foreign Direct Investment was 0.55 trillion, with the lowest value of 0.00 trillion in Bangli Regency in 2018 and the highest of 4.90 trillion in Badung City in 2017.

The average Domestic Investment is 1.05 trillion, with the lowest value of 0.525 billion in Gianyar Regency in 2017 and the highest of 14.03 trillion in Denpasar City in 2015. The average regional income amounted to 588.18 billion, with the lowest value of 22.96 billion in Bangli Regency in 2011 and the highest of 4835.19 billion in Badung City in 2019. The average Human Development Index (HDI) was 72.66 points, with the lowest value of 62.00 points in Karangasem Regency in 2011 and the highest of 84.03 points in Denpasar City in 2021.

Table 5. Descriptive Analysis<sup>5</sup>

Variable	Mean	Min	Max	Std
Gross Regional Domestic Product (GRDP)	14.79	2.92	37.33	9.54
Foreign Direct Investment	0.55	0.00	4.90	1.02
Domestic Investment	1.05	0.00	14.03	1.92
Regional Income	588.18	22.96	4835.19	945.42
Human Development Index (HDI)	72.66	62.00	84.03	5.66

The regression model requires no high multicollinearity between independent variables, as can be seen from the Variant Inflation Factor (VIF) value of less than 10. In Table 6, all independent variables had VIF values of less than ten in this study. This result means all independent variables are used in the model.

Table 6. Multicollinearity Test<sup>6</sup>

Variable	VIF
Foreign Direct Investment	1.50
Domestic Investment	1.48
Regional Income	3.13
Human Development Index (HDI)	1.50

Before further analyzing modelling in panel data regression analysis, panel model selection is carried out. The authors used the tests mentioned in the methodology section through the three tests in Table 7. Fixed effect models are considered the best for describing relationships between research variables.

Table 7. Panel Model Test<sup>7</sup>

Test	Test Value	Prob. Value	Conclusion
LM BP Test	517.88	0.00	The random model is better than the Common/Pooled Model
Chow Test	517.88	0.00	A fixed model is better than a Common/Pooled Model
Hausman test	11.3	0.00	A fixed model is better than Random Model.

Once the panel model is selected, then the panel-chosen model is not interpreted directly but tested for classical assumptions. This test is intended so that the chosen model can be used to see the effect of prediction. The assumptions used are the assumptions of normality, heteroscedasticity, and autocorrelation. In Table 8, the normality assumption is satisfied. The probability value is more

significant than 0.05. On the other hand, there is still a violation of heteroscedasticity and the hypothesis of autocorrelation. The probability value of each test is less than 0.05.

Table 8. Classical Assumption Test8

Test	Test Value	Prob. Value	Conclusion
Shapiro–Wilk tests	0.495	0.495	Data Normal
Breusch–Pagan test	1.07	0.3019	Non-Heteroscedasticity
Wooldridge test	151.9830	0.000	Autocorrelation

Due to violating the autocorrelation assumption, the fixed model is transformed using the Panel Corrected Standard Error / PCSE model (Greene, 2018). The final model used can be seen in Table 9.

Table 9. Hypothesis test9

Variable	pooled	fixed	random	PCSE
Foreign Direct Investment	.0385***	-0.00180	-0.00150	.0189**
Domestic Investment	.0578**	0.00050	0.0009	0.0179*
Regional Income	.2507***	.0649***	.0670***	.2072***
Human Development Index (HDI)	.0391***	.0698***	.0697***	.0578***
constant	0.5257	3.0485***	3.0053***	0.7110
R <sup>2</sup>	0.8314	0.9252	0.9251	0.9724
F/Chi	115.86	265.82	1020.98	865.36
Pro	0.0000	0.0000	0.0000	0.0000

From Table 9 above, the coefficient of determination is 0.9724. The value of the coefficient means that all independent variables can explain the variation in the percentage of poor people by 97.24 percent; other variables outside the model influence the remaining 2.76 percent. The F test shows that all the independent variables together affect the IPEI. This result is identified by a statistical probability value  $F = 0.00$ , more diminutive than  $\alpha = 0.05$ . These results mean that the modelling done is appropriate. From the partial test identified with the probability value, the t-test designates that all significant variables are influential where the probability value is  $0.000 < \alpha 0.05$ . The regression equation is formed:  $GRDP = 0.1893 \text{foreign investment} + 0.0179 \text{domestic investment} + 0.2072 \text{regional income} + 0.0578 \text{HDI}$

## Discussion

Domestic Investment has a significant positive effect on economic growth in Bali, with a coefficient of 0.0189. An increase of 1 percent PMDN will increase economic growth by 0.0189 percent assuming other variables are constant. Foreign investment can have a significant influence on a country's economic growth. Overseas investment can bring new technologies, resources, and markets and improve the competitiveness of domestic industries. In addition, foreign investment can also positively impact increasing the community's employment and income. The results of this study are in line with the research of Wahyudi and Wibowo (2019), Sukirno and Nasution (2020), Ramdhani and Ismail (2021), Nurlaela and Rahmawati (2021) and Asmara & Rahmawati (2021)

Foreign Direct Investment has a significant positive effect on economic growth in Bali, with a coefficient of 0.0179. An increase of 1 percent PMDN will increase economic growth by 0.0179 percent assuming Other variables are constant. Domestic investment can have a significant influence on a country's economic growth. Domestic companies' investments can increase production, create new jobs, and increase economic competitiveness in the international market. The results of this study are in line with the research of Wahyudi and Wibowo (2019), Sukirno and Nasution (2020), Ramdhani and Ismail (2021), Nurlaela and Rahmawati (2021) and Asmara & Rahmawati (2021)

Regional income significantly positively affects economic growth in Bali with a coefficient of 0.2072. An increase of 1 percent PAD will increase economic growth by 0.2072 percent assuming other variables are constant. Regional income has a significant influence on the economic development of a region, where with an increase in regional income, the region can improve regional infrastructure,

which ultimately increases the growth of its economy. The results of this study are in line with the research of Firdaus (2017), Basri and Rahardja (2018), Daulay & Prasetyo (2019), Akbar & Kholifah (2020) and Arifin (2021).

The Human Development Index (HDI) has a significant positive effect on economic growth in Bali, with a coefficient of 0.0578. An increase of 1 percent HDI will increase economic growth by 0.0578 percent assuming other variables are constant. The Human Development Index (HDI) significantly influences a country's economic growth. HDI covers three dimensions: health, education, and a decent standard of living. Countries with high HDI tend to have better quality human resources to increase competitiveness and economic productivity. The results of this study are in line with the research of Sujarwoto (2015), Akbari and Chalaki (2017), Nwaogu & Okorie (2018), Rauf et al. (2019) and Tuck et al. (2019).

#### 4. CONCLUSION

Fixed effects models are the best based on panel model testing (Chow, LM BP, and Hausman). There is still a violation of the classical assumptions of heteroscedasticity and autocorrelation. Fixed models are transformed with PCSE models. The results obtained showed that all independent variables together have a significant effect on the growth rate in Bali. Partially, investment, local native income and human development index have a significant positive impact on the economic growth rate in Bali. Based on the results of this study, comprehensive policies related to macro-social economics are needed so that the economic growth rate in Bali increases sustainably. For further research, it may be possible to add other potential independent variables that affect economic growth, such as unemployment, poverty and others. While in subsequent modelling can use the panel model by using random effects, named panels or spatial effects in the panel model).

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