

# Foreign Direct Investment and Regional Inequality in Banten Province

Rizal Rachmatullah<sup>1\*</sup>, Indra Nur Hidayat Pratama<sup>2</sup>, Lilis Nur Kholishoh<sup>3</sup>, Sheesar Tonny Gunawan<sup>4</sup>, Lia Widiawati<sup>5</sup>, Andri Handayani<sup>6</sup>, Cep Jandi Anwar<sup>7</sup>

{rizalrachmatullah7@gmail.com<sup>1\*</sup>}

Master of Economics Study Program, University of Sultan Ageng Tirtayasa<sup>1234567</sup>

**Abstract.** The aim of this paper was to investigate the effect of foreign direct investment and other macroeconomic variables on the regional inequality between districts/cities in Banten Province for the data from 2010 and 2021. In this study a panel data analysis method with a fixed effect estimation was performed. We find that foreign direct investment and unemployment have a positive and significant effect on regional inequality. While the effect of government spending has no effect on inequality.

**Keywords:** Foreign Direct Investment, Government Spending, Unemployment, Regional Inequality, Williamson Index, Banten Province.

## 1 Introduction

Regional inequality is the economic activity of a region. Inequality is produced by regional disparities in geographical circumstances. As an outcome of these variances, a region's ability to stimulate the growth process varies. As a result, it is not unexpected that each region has both developed and impoverished regions. The existence of disparities between these locations lies in the high disparity (gap) between regions. This can be seen from economic activities, infrastructure development, to the level of poverty that is so unequal. This also affects how regional development policies are created and implemented by local governments.

Foreign investment is an major determinant in encouraging the economic growth of a region. According to Myrdal (1957) in [1] revealed that investment can cause inequality. Not only investment affects inequality between regions, the difference in development spending also plays a role in influencing inequality. According to McEachern (2000) that fiscal policy affects macroeconomic factors including employment, price levels, and GDP levels through government spending, transfer payments, taxes, and loans. Not only development spending that affects the occurrence of inequality between regions, demographic differences also play a role in influencing inequality. According to [2], look at the demographic conditions and the unemployment rate of an area. According to [2], the high unemployment rate is related to increasing regional inequality.

**Table 1.** Data Regional Inequality, FDI, Development Expenditure, and Unemployment

County/City	Regional Inequality	FDI	Development Expenditure	Unemployment
Tangerang Selatan	1,2	712253	15751	8,6
Tangerang	1,1	1882321	14575	9,07
Serang	3,6	952879	13281	9,41
Cilegon	0,03	9947211	13041	10,13
Kab Tangerang	5,6	4211884	12273	9,06
Kab Serang	8,2	1267005	10713	10,58
Kab Pandeglang	1,1	311	8635	7,7
Kab Lebak	1,8	915712	8724	7,86

Table 1 can be explained by fluctuating inequality data in 2021. Where Cilegon has the lowest score (0.03), compared to other urban districts. Cilegon City is also the city with the largest amount of investment with (9947211) in 2021. Meanwhile, South Tangerang City has the highest development expenditure of (15751). And the highest number of unemployed is in Serang District with (10.58).

Economic development is not only the goal of the central government, but also the goal of every region in a country. Regional economic development involves local governments and communities managing existing resources and forming partnerships with the private sector to create jobs and promote economic activity [3]. Therefore, economic development policies are carried out to obtain high growth in the economy through the management of each region's potential and resources. Economic development carried out by each region cannot be separated from the problems of growth and development inequality between regions or regions with one another. In other words, high economic growth has not been able to overcome the problem of inequality between regions.

Previous research that became a reference and comparison of the results concerning regional inequality using the panel data method were [4], [5] investment had an effect on regional inequality, [6] government expenditure had a negative effect significant impact on inequality [7], [8] unemployment has a significant positive effect on regional inequality.

## 2 Methods

To find regional inequality data, the Williamson index is used. Williamson introduced the Vw (weighted index or weighted index to population) and Vuw (unweighted index) models to quantify the income per capita inequality of a nation at a particular moment. Although this index has several weaknesses, namely, it is sensitive to the definition of the area used in the calculation, however, this index is commonly used in measuring development inequality between regions [9].

This study employs secondary data in the form of panel data, which combines cross-sectional and time series information for the period 2010-2021. Panel data is used to overcome the problem of limited cross section and time series data by producing more efficient estimates through increasing the number of observations which has implications for increasing the degree of freedom. Panel data used in this study covers 8 regencies in Banten province, namely Cilegon City, Lebak Regency, Tangerang Regency, Pandeglang Regency, Tangerang

City Serang Regency, Serang City, and South Tangerang City. Our data set consists of 4 variables: regional inequality, investment, development spending and unemployment.

$$IW = \frac{\sqrt{\sum(Y_i - Y)^2 f_i / n}}{Y} \quad (1)$$

Information :

IW = Williamson Index Value  
 Y<sub>i</sub> = GRDP per capita District i  
 Y = Provincial average GRDP per capita  
 f<sub>i</sub> = Total population of Regency i  
 n = Total population of Province

The econometric methodology that we use in this model is multiple regression equations by performing panel data, which combine of cross-section and time series data. To get the appropriate panel estimation, general effects model, and random effect and fixed effect model were tested using Chow and Hausman tests. And we will perform the classic assumption test, and perform other important tests.

To examine the effect of the variables of foreign investment, development spending and unemployment on inequality, we perform a panel data with fixed effect estimates. In addition, classical assumptions and other important tests will be performed on the model. It can be written as follows:

$$Reg_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 DE_{it} + \beta_3 Unem_{it} + \epsilon_{it} \quad (2)$$

In equation (2),  $i = 1, 2, \dots, N$  for regencies/cities,  $t = 1, 2, \dots, T$  for time series, Reg is the realization of regional inequality, FDI is the realization of foreign direct investment, DE is the realization of development spending, Unem is the realization of unemployment.

## 4 Result and Discussion

In this study, the relationship between FDI and Regional Inequality models panel:

### 4.1 Descriptive Statistics

**Table 2.** Descriptive Statistics

Variablel	Mean	Std. Dev.	Min.	Max.
Regional_inequality	3.654167	8.071673	-15.00000	61.30000
FDI	2670154	2837935	210.0000	9947211
Development_expenditure	11402.47 264	7.396	1017.000	15988.00
Unemployment	10.37938	2.828142	4.560000	19.84000

Table 2 displays the research data for the variables that will be utilised in this study during an eleven-year period. For regional inequality data, the minimum value is -15.000.00 and the highest is 61.30000. This shows that there is an inequality of 61.3 percent that occurred in the district and city of Banten province in 2010-2021. Another fact is that FDI gives a maximum value of 9,947,211 billion in Cilegon City. And unemployment gets a maximum value of

19.8% in Serang district. Development expenditure in South Tangerang has a maximum value of 15988.00, to have an impact on infrastructure development.

#### 4.2 Result of the Chow and Hausman Tests

**Table 3.** Results of Hausman and Chow Tests

Num.	Testing	Value	Conclusion
1.	Chow test		FEM
	<i>Chi-square</i>	15.243	
	<i>Prob.</i>	0,0033	
2.	Hausman test		FEM
	<i>Random</i>	14.009	
	<i>Prob.</i>	0.0053	

The results of the Chow and Hausman tests are shown in Table 3. The Chow test revealed a probability Chi-Square 0.0033 , while the Hausman test showed a random probability 0.0053. On the basis of these tests, it can be determined that the fixed effect model (FEM) is the best appropriate panel data regression estimate model for this investigation.

#### 4.3 Result of Classical Assumption and Normality Tests

To determine the validity of the research data, The conventional assumptions (heteroscedasticity, multicollinearity, and autocorrelation) and normality tests must be examined.. Table 4 presents a correlation matrix for detecting multicollinearity issues. Multicollinearity issues arise, in accordance with Asteriou and Hall (2015), if the correlation between the independent variables is higher than 0.80. Table 4 displays the independent variables' correlations that are less than 0.80. Therefore, it can be stated that our model does not have a multicollinearity issue.

**Table 4.** The Result of Multicollinearity Test

	FDI	DE	UNEM
FDI	1.0000	0.2344	0.0338
DE	0.2344	1.0000	-0.2703
UNEM	0.0338	-0.2703	1.0000

**Table 5.** The Results of the Heteroscedasticity, Autocorrelation and Normality Tests

Num.	Testing	Value	Conclusion
1	Heteroscedasticity		$X^2_{count} < X^2_{96,0,05}$ no heteroscedasticity
	<i>n-observed</i>	96	
	<i>r-squared</i>	0.6110	
	<i>Chi Square</i> count	58.560	
	<i>Chi Square</i> table	119,8709	
2	Autocorrelation (Durbin-Watson test)		DU < 1.9696 < 4 - DU
	<i>Durbin-Watson</i> count	1.9696	
	<i>Nilai DL</i>	1.5821	

	Nilai DU	1.7553	<i>no autocorrelation</i>
	Nilai 4-DU	2.2447	
	Nilai 4-DL	2.4179	
3	Normality (Jarque-Berra <i>test</i> )		
.	Jarque-Berra	5.9830	<i>normally distributed</i>
	<i>Prob.</i>	0.0502	

Table 5 describes the results of the White test to detect the presence of heteroscedasticity problems. The results of the Durbin-Watson test to detect autocorrelation problems and the Jarque Berra test to see whether the data are normally distributed or not, conclude that the data are free from heteroscedasticity and autocorrelation problems and the residual data are normally distributed.

#### 4.4 Result of Fixed Effect Model

The outcomes of panel data estimate using the fixed effect model are shown in Table 6. The variables of investment and unemployment significantly and positively affect inequality. Development spending has no effect on inequality. The coefficient of determination (r-squared) is 0.6110, respectively. R-squared indicates that the independent variable predicts 61.10% of the variation in changes in foreign investment, whereas the remaining 38.90% is explained by other factors not included in our model used in this research. Our model's F-statistic is 13.35. This conclusion suggests that at the 1% level, all independent factors have a substantial influence on the dependent variable.

**Table 6.** Fixed Effect Estimation

Variable	Estimate	t-Statistics	Prob.
FDI	3.0000	6.5515	0.0000***
DE	0.0001	2.6219	0.1085***
UNEM	0.1391	2.6096	0.0107**
Constant	-0.3603	0.2999	0.7650
R <sup>2</sup>	0.6110		
Adj. R <sup>2</sup>	0.5653		
F-statistic		13.35597	0.0000***
Durbin-Watson stat	2.1963		

Foreign investment, development spending and unemployment have a joint effect on inequality. The magnitude of R<sup>2</sup> is 0.6110. This demonstrates that variations in the independent variable may account for variations in the dependent variable (regional inequality) to a level of 61.10%. As a result, the independent variable may explain the dependent variable to a degree of 61.10%, while additional factors beyond the scope of our study can explain the remaining 38.90%. We will first look about how the investment will affect inequality. With a coefficient of 3.0000, we find that investment has a significantly positive influence on inequality. This finding indicates that a rise in foreign investment implies a decrease in inequality by 1 percent. This is in accordance with an empirical study conducted

by Rustianik Istiqomah (2018), showing empirical evidence of a significant positive effect of foreign investment on regional inequality [10]. Development spending has no effect on inequality. This is in accordance with the empirical study conducted by Fichta Apriliani (2020), showing empirical evidence that there is no influence of development spending on regional inequality [11]. But the increasing number of unemployed can reduce the amount of inequality that most workers in Banten low-paying employment in the informal economy. This condition resulting in an equitable distribution of people's income, but in a low income group, when viewed from the aspect of economic equality, the Banten community with high levels of unemployment will have an impact on reducing inequality, but from the perspective of community welfare, this is very contrary to the goals of development in Indonesia. This is in accordance with an empirical study conducted by Shavira Octavia (2019), showing empirical evidence of a significant positive effect of unemployment on regional inequality [12].

## 5 Conclusion and Recommendations

This paper explains that investment and unemployment have a significant positive impact on inequality. While development spending has no significant impact on inequality, this reveals that local governments are still not evenly distributed in building facilities or infrastructure and regional infrastructure is very clearly different from urban areas. This result is in accordance with previous research.

Our findings lead to a number of suggestions. First, it is important to optimize the foreign investment in each district and city, such as for job development, to reduce unemployment, alleviate poverty, and boost people's money to spend. Second, this research support the government to be more active in overcoming inequality and various aspects related to inequality. Third, we encourage to reduce the unemployment rate in every district and city in Banten Province.

Our research can be enhanced to future empirical studies such as adding other variables and comparing results from districts/cities of each province throughout Indonesia.

## References

- [1] M. L. Jhingan, *Development Economics and Planning*. Jakarta: PT. King Grafindo Persada, 2010.
- [2] C. Lessmann, "Fiscal Decentralization and Regional Disparity: A Panel Data Approach for OECD Countries," *Ifo Work. Pap. Ser.*, no. 25, pp. 1–32, 2006, [Online]. Available: [http://ideas.repec.org/p/ces/ifowps/\\_25.html](http://ideas.repec.org/p/ces/ifowps/_25.html)
- [3] L. Arsyad, *Development Economics*, 5th ed. Yogyakarta: UPP STIM YKPN, 2010.
- [4] B. Hartono, "Analisis Ketimpangan Pembangunan Ekonomi di Provinsi Sumatera Utara," Diponegoro University, Semarang, 2008. [Online]. Available: <http://stmb-multismart.ac.id/ejournal/index.php/JMBA/article/view/37%0Ahttp://stmb-multismart.ac.id/ejournal/index.php/JMBA/article/download/37/33>
- [5] Barika, "Inequality Analysis of Regency/City Regional Development in Bengkulu Province," University of Bengkulu, 2015.

- [6] R. Diniar, "Analysis of Factors Affecting Regency/City Spatial Inequality in Banten Province," Diponegoro University, Semarang., 2015.
- [7] A. Alfaiz, "Analysis of the Effect of Economic Growth, Agglomeration, Unemployment Rate and Road Length on Inequality Between Regions," Diponegoro University, Semarang, 2011.
- [8] Yeniwati, "Economic Inequality Between Provinces in Sumatra," Padang State University, 2010.
- [9] Sjafrizal, *Regional and Urban Economics*. Jakarta: PT Raja Grafindo Persada, 2012.
- [10] I. Rustianik, "Analysis of the Influence of Economic Growth, HDI And Investment (FDI) on Development Inequality Between Province," Brawijaya University, Malang., 2018.
- [11] A. Fichta, "Analysis of Factors Affecting Inequality in Income Distribution in West Papua Province 2015 – 2020," Papua University, 2020
- [12] O. Shavira, "Analysis of the Effect of Poverty, Open Unemployment and Investment on Income Inequality," Brawijaya University, Malang., 2019.