# Regional Disparity in Western and Eastern Indonesia

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*Abstract:*

*Purpose: This study aims to analyze the regional disparity trend of Indonesia's in 2007-2015 and the factors affecting it. The study aims to encourage the gap to be reduced by appropriate development policies in Indonesia.*
*Approach/Methodology/Design: The study uses panel data from 33 provinces from 2007 to 2015, so 297 observations. The analytical method uses two approaches, descriptive analysis with graphical comparison and panel regression analysis with a fixed-effect model.*
*Findings: The results showed that inequality in the West is higher than inequality in the East. The results also found differences in factors affecting inequality in Western Indonesia Region (WIR) and Eastern Indonesia Region (EIR). The increase in electricity distribution and investment has a significant effect on reducing inequality at the WIR. Meanwhile, the development of road infrastructure has increased inequality in the WIR. There are similarities with different strengths that increasing investment can play a role in reducing regional disparity.*
*Practical Implications: Thus, to reduce regional inequality, the Indonesian government and related parties need to encourage increased investment to develop electricity infrastructure in Western Indonesia and encourage employment in Eastern Indonesia.*
*Originality/Value: There are diverse contributions in each region to the formation of GDP growth nationally. So, it is suspected of having occurred regional inequality in Indonesia. For this reason, research is needed to analyze whether disparities in regional development have occurred.*

*Keywords: Regional disparity, road infrastructure, investment, panel regression, Indonesia.*

*JEL classification: D63, H54, O18, O47.*

*Paper Type: Research article.*

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## 1. Introduction

In every country, including Indonesia as a developing nation, economic performance is continuously improved. GDP is an indicator of the economic output of a nation (Mankiw, 2007). An increase in GDP, therefore, indicates that the economic output of a nation is increasing. Indonesia's 2007 GDP amounted to 1.822.500.3 billion (IDR) according to data from the Central Bureau of Statistics (BPS). This number increased to 2.851.195.2 billion (IDR) in 2015, which rose by 50 percent in eight years (BPS 2017). This shows that Indonesia performs very well.

In order to improve a country's economy, high-income growth is important. Further studies are required to decide what players contribute to economic growth (Todaro, 2012; Prasetyo and Firdaus, 2009). When too little succeeds, economic growth (Jhingan, 2013) can only intensify wealth inequalities. Indonesia's fast GDP growth is not matched by strong income equality. The economic output of each district/city is different and causes inequalities. In 2007, the average regency/city GRDP variance coefficient in all the Indonesia provinces was 0.535. The average has decreased in 2015 to 0.499 (BPS, 2017). It indicates that attempts have been made to resolve the gap between the various areas.

Faced with labor demand, skilled workers' availability will increase productivity, thus growing economic growth in the region. It affects inequality (Yeniwati and Riani, 2012). As a result, theories and theory of economics in the last two decades have also been built on regional inequality and convergence, such as Yeniwati and Riani (2012), Barro and Sala-I-Martin (2004), Martin and Sunley (1998), Quah (1992). Exposure to labor is one of the guiding forces in producing goods and services in the theory of Cobb-Douglas growth model. However, unequal labor availability among regions can cause economic growth disparities, leading to economic disparities between regions. If the expenditure is not uniformly distributed, there would be inequalities between regions (Kailei *et al.,* 2008). Some areas will have fast economic growth, others will have sluggish growth. This is due to investors' preference for investing in urban or high-quality infrastructure areas (Kurniasih, 2012).

The vast territory of Indonesia stretches over many islands. This large area causes every province to have a different population, climate, and economic characteristics. Western Indonesia Region (WIR) has a different economic characteristic distinct from that of the Eastern Indonesia Region (EIR) (Miranti and Resosudarmo, 2005). The government should also ensure that economic policies are implemented successfully in each region to promote economic growth and economic equality. Based on Presidential Decree 44 from 2002 concerning the EIR Development Council, the government divides the WIR and EIR and states that the EIR includes the provinces of the Islands of Kalimantan, Sulawesi, Nusa Tenggara and Maluku, and Papua. In short, the WIR field includes Sumatra, Java, and Bali Islands.Yeniwati and Riani (2012) showed that poverty rates, workforce involvement, and exports

significantly influence disparities between Sumatra regions. Poverty and export levels affect inequalities positively, while job participation rates have a negative effect. Resosudarmo and Vidyattama (2006), Akira and Alisjahbana (2002), and Akira and Lukman (1995) discovered regional disparities. Pribadi *et al.* (2015) suggest that regional inequalities are the product of economic policies geared towards growth and generate reverse washing rather than reversal effects in areas. As a strategic strategy for fostering regional equity, they propose new growth poles in Medan, Palembang, Balikpapan, Gorontalo, Makassar, and Ternate. Kuncoro and Murbarani (2016) found that regional differences in 26 Indonesian provinces continue to decrease during 1994-2012. However, they found that economic accessibility, FDIs, and geographic variables dictated the differences.

Nawangsari (2012) found that educational variables and international investment have a positive effect on regional inequalities. Demurger (2000) has published a report on income inequalities in regions called "Infrastructure construction and economic growth." Our study in 2020 found that there has been a direct effect on economic growth in Indonesia on the provision of public infrastructure (Nugraha *et al.,* 2020). FDI's had a positive impact on China's economic growth differences, but the incoming FDI was not uniformly propagated (Wei *et al.,* 2008). The result was that FDI triggered inequalities in economic growth between regions in China.

The above discussion indicates that specific contributions to the development of GDP growth nationally occur in each country. Therefore, work is required to examine whether regional development inequalities have occurred. An analysis will be performed using data from 33 Indonesian provinces using panel data regression to determine the factors causing this disparity. In particular, this research aims to achieve the following objectives: (1) overview of the extent of economic development inequality in Indonesia between 2007 and 2015; (2) the study in 2007-2015 in Western Indonesian Region (WIR) and Eastern Indonesia Region (EIR) of the variables of infrastructure, human resources, and financial resources affecting inequalities; (3) the examination in 2007-2015 of the disparities in infrastructures, human resources, and financial resources in Western Indonesia and Eastern Indonesia. The highest available panel data is for 2007-2015. We also need to learn the current President's agenda, particularly to build Indonesia from the outskirts (East Indonesia Region).

## 2. Research Methodology

The data used for this study are secondary data from publications issued by the Central Bureau of Statistics (BPS). This study using panel data from 33 Provinces (excluding Kalimantan Utara Province) throughout the 2007 to 2015 period. The variables used consist of electricity distribution, provincial investment, the length of the road, and the labor force participation rate by the use of direct data without being processed. Meanwhile, the disparity variable is measured using the coefficient of variance from the GRDP of the city district for each province. GRDP is collected

from various statistical publications in Indonesia which come from BPS. The greater the value of the coefficient of variance indicates the level of inequality is also higher. GRDP uses constant prices with base year 2000.

## 3. Research Analysis

The analytical method used in this study is descriptive analysis and inferential analysis. Descriptive analysis is used to observe a graphical description of each variable used in the model. The inferencing analysis in this study used a panel data regression analysis method conducted in 33 provinces in Indonesia and used data from 2007-2015. An analysis to determine the differences in the influence of these variables in the WIR and EIR was carried out. The tested variables are road density, the percentage of the population with access to electricity, the rate of labor force participation, and the realization of province investment. The analytical method used in this study is panel data regression. In the regression panel, there are three effect models, namely the Common effect Model / Pooled (CEM, Equation 1), Fixed effect Model (FEM, Equation 2), and Random effect Model (REM, Equation 3). These three models are as follows:

1. CEM

$$\ln Disparity_{it} = \alpha + \beta_1 \ln Road_{it} + \beta_2 Electricity_{it} + \beta_3 \ln Invest_{it} + \beta_4 \ln LFPR_{it} + \varepsilon_{it} \quad (1)$$

2. FEM

$$\ln Disparity_{it} = \alpha_i + \beta_1 \ln Road_{it} + \beta_2 Electricity_{it} + \beta_3 \ln Invest_{it} + \beta_4 \ln LFPR_{it} + u_{it} \quad (2)$$

3. REM

$$\ln Disparity_{it} = \alpha + \beta_1 \ln Road_{it} + \beta_2 Electricity_{it} + \beta_3 \ln Invest_{it} + \beta_4 \ln LFPR_{it} + \omega_{it} \quad (3)$$

Where:
i: Aceh,..., West Papua; t: 2007, …2015; α: intercept; Disparity: Province disparity (CV); Road: road density; Electricity: percentage of households with access to electricity; Invest: realization of foreign investment; LFPR: labour force participation rate

## 4. Results

The disparity in economic development between regions is described as the income per capita between districts/cities in the province. The average disparity between regions in Indonesia from 2007 to 2015 decreased from 0.535 to 0.499. When viewed based on the region, Indonesia's Western region has a higher disparity compared to Eastern Indonesia**.** In the WIR, the lowest level of disparity in 2015 was found in the Province of Bangka Belitung, which amounted to 0.08, while the highest disparity occurred in East Java and Banten Provinces with 1.41 and 1.14 respectively. The disparity in East Java tends to be high because several districts/cities have a higher per capita income than others. The level of disparity in

EIR in 2015 was triggered by a high level of disparity in the provinces of Papua. The disparity in West Papua Province is 1.18, which is relatively high compared to other provinces in Eastern Indonesia. The disparity between districts in Papua Province is also relatively high, amounting to 1.07. This is due to a United States-owned mining company, Freeport, in the Mimika Regency. The output from Freeport significantly affects the income of the Mimika regency very high compared to other regions.

The average road density describes road infrastructure as a support for the mobility of goods and services between regions. The more congested the roads are in the province, the more the area is connected to the economy, which is expected to equalize the region's economy. From 2007-2015, the average road density in the provinces in Indonesia increased. In 2007, the average road density reached 672.38 per km of the province. Continues to increase every year, and 2015 reached 782.98 per km of the province's total area. Broadly speaking, there is a negative correlation between road density and disparity in Indonesia. For the period 2007-2015, the average density of roads in Indonesia's provinces has increased. Increased road density in the period reached 16%. However, road infrastructure improvement is not comparable to the reduction in inequality, which only reached 7% in the same period.

There are increasing numbers of households with access to electricity from State Electricity Company (PLN), especially towards the rural areas, which are expected to be drivers of the countryside's economy. The growth of the countryside's economy is expected to reduce the disparity between the rural and urban areas.

The percentage of households with PLN access to electricity in the Western Region of Indonesia increased on average from 83.70% in 2007 to 94.64% in 2015. The increase in WIR was supported by an increase in provinces on the island of Sumatra. While for the regions of Java and Bali, there has been a slight increase because the development focus has changed, so it does not rule out equitable development. In 2007, the average percentage of households receiving PLN electricity in EIR was 66.83%, increased until 2015 and reached an average of 80.68%. Some provinces where previously had percentages below 50%, such as East Nusa Tenggara, Gorontalo, and West Papua, were successfully increased to above 60%. Meanwhile, the percentage in Papua Province has decreased slightly. This is due to the high growth in the number of households in Papua Province, where there was an increase from 2007 to 2015.

The labor force participation rate illustrates the state of labor available to produce goods and services in a region's economy. A higher LFPR means more labor is available to produce goods and services. The correlation between LFPR and disparity between regions in Indonesia tends to be negative. Indonesian LFPRs for 2007-2015 tended to increase from 67.89% in 2007 to 70.1% in 2015. Indonesian LFPR had the highest percentage peak, with 70.87% in 2011.

WIR has expanded its workforce from 2007 to 2015. The number of employees of WIR amounted to 90,04 million in 2007 while the number of employees rose to 98,51 million in 2015. This rise in the number of jobs accompanied improvement in the labor force participation rate, which rose 65.73% in 2007 to 69.60% in 2015. The number of EIR staff has risen to 19% between 2007 and 2015. In 2008, job participation in EIR declined. This is because of the global crisis in many countries, which has caused Indonesia's exports to decrease in value. This export decline would affect employment. After 2008, in the wake of the 2008 global crisis, the TPAK in Eastern Indonesia steadily increased along with the Indonesian economy's improvement.

Investment is one of the contributors to the economy. Investment, both from domestic and abroad, is the needed stimulus to encourage goods and services. The Indonesian domestic investment in the provinces from 2007 to 2015 has increased. The average investment in Indonesian provinces in 2007 was 1056.93 billion Rupiahs. This number increased to 5,410,427 billion Rupiahs. This shows that investors view the Indonesian economy as promising. FDI in Indonesia in 2007-2015 tended to increase, FDI entering Indonesia reached USD 10.34 billion. Increased until 2015, the FDI that entered Indonesia reached 29.04 billion USD. It had been a decline of 4 billion USD from 2008 to 2009, which is the impact of the global crisis that hit many countries in the world. Broadly speaking, the number of FDIs that enter into has a negative correlation with inequality between districts/cities in Indonesia.

In 2015, Indonesia's FDI distribution was still concentrated in the Java region. This can be seen that realization of foreign investment in Java is the largest in Indonesia, with 53% of national realization. More specifically, in WIR areas, provinces such as West Java, DKI Jakarta, and East Java have the highest percentages of 9%, 12%, and 20% of the total FDI entering Indonesia. This shows that foreign investors prefer to invest their capital in industrial areas such as West Java and East Java. Meanwhile, the distribution of FDI in EIR in 2015 was dominated in the Kalimantan area. Foreign capital entering the Kalimantan region reaches 19% of the realization of national PMA. The provinces of East Kalimantan and West Kalimantan that received foreign capital reached 8% and 5% of the total FDI entering Indonesia.

## 5. Discussion: Determinants of Disparity between Regions in Indonesia

This research uses panel regression analysis to determine which model is better suited for defining inequality between Indonesian regions in advance. There are three models, pooled models, fixed effects, and random effects. This study aims to compare the models in WIR and EIR so that both models must have the same effect. The best effect selection test is conducted within Indonesia's scope so that the same effect can be determined for WIR and EIR models.

If the conventional assumptions are met, it is possible to estimate which variables influence Indonesia's regional differences. The prob (F-statistic) of the WIR model is less than 5% so that the zero-hypothesis is rejected. It can be assumed that independent variables in the model will, at the same time, affect the differences between the WIR regions. This is accompanied by an adjusted R2 of 0.9977, which means that the model's independent variables can explain 99.77% of regional inequalities in the WIR. The EIR model has a sample value (F-Statistic) of 0.0000. This means that the null hypothesis is rejected at 5% and that independent variables in the model will, at the same time, affect inequality in East Indonesia. The modified R2 is 0.9564, which means that the model can describe 95.64% of regional variance differences in Eastern Indonesia (Table 1).

**Table 1.** *Comparison of Determinants of Disparity in WIR and EIR*

| Model | Independent Variables | | | |
|---|---|---|---|---|
| | Road | Electricity | LFPR | LFPR |
| Disparity in WIR | 0.0811 (0.0100)* | -0.2372 (0.0000)* | -0.0024 (0.2869) | -0.0037 (0.0000)* |
| Disparity in EIR | 0.0606 (0.5255) | 0.0018 (0.0409)* | -0.1945 (0.0041)* | -0.0082 (0.0703) |

**Note:** *(\*) Significant in 5 percent(\*\*) Significant in 1 percent*
**Source:** *Own study.*

The road density variable has a significant impact on the disparity between regions in WIR, whereas it is not significant in WIR. In the WIR model, the road density is 0.0811. This means that an increase in road density by 1% will increase regional inequalities by 0.0811%. Positive coefficients indicate the effect of backwashing. The backwashing effect occurs when an area experiencing economic growth attracts the resources of other nearby regions so that there is a difference in economic growth between the regions destined for the transfer of resources and the areas left behind (Nasution, 2015). This is also supported by the fact that the WIR industries are mostly concentrated in several regions and absorb resources from other regions.

WIR provinces with manufacturing in some regions would have created imbalances as resources from other regions will be consumed by backwash effects in these industrial areas. An example of this is the province of East Java, where East Java's economy is concentrated in Surabaya District, Regency de Sidoarjo, District of Kediri, and the City of Gresik. This means that other areas can not sustain the city's economy, which creates imbalances. The province of East Java had a GRDP of 453 trillion rupiahs (2000 = 100), Indonesia's second-highest GRDP. However, it can be seen from its constituents that imbalances exist in the Eastern Java region. The East Java province has 37 regencies, but the Towns of Surabaya and Kediri, and the districts of Sidoarjo and Gresik, make up 46% of GRDP in the East Java province. These four cities/districts are East Java industrial centers.

For both models, the variable percentage of electric households is substantial at 5%. There is a coefficient discrepancy between the WIR and the EIR. With the rise of 1% in WIR households consuming PLN electricity, geographical inequalities will be reduced by 23.72%. In East Indonesia, an increase of 1% would increase inequality by 1.85%. The discrepancy in the sign for this coefficient is due to the variations in characteristics where electricity distribution is still relatively unequal in East Indonesia compared to WIR. In the EIR, which is not identical to WIR yet, the growth of electrical infrastructure impacts differences between WIR and EIR. Electricity infrastructure growth in East Indonesia would raise inequality. This corresponds to Kuznet 's observation that inequality would increase in the early stages of growth, followed by a decrease in later stages. Electricity infrastructure growth would start with the delivery to urban areas and take time to cover complex areas to create imbalances in the early stages. The iniquities will decrease as electricity system development continues to reach larger areas.

The labor force has a significant impact on inequalities in East Indonesia. An increase of 1% in the workforce will reduce inequalities by 0.19%. This is consistent with the research carried out by Yeniwati and Riani (2012) in which an increasingly large population will cause variations and the number of employees to increase. Changes in the number of balanced employees with high employment opportunities will be able to absorb the new workforce. Absorption of this workforce will increase the community's income, ultimately increasing the purchasing power of the people so that the demand for goods and services is higher, which then encourages producers to produce more and more so that economic activity is well underway and economic inequality is reduced.

Foreign investment has a significant impact on WIR 's inequality. Increased FDI implementation by 1% will reduce regional disparities by 0.003%. Foreign investment will improve economic performance and will be followed by employment, resulting in an increase in the regional economy and reducing regional disparities. The manufacturing sector supports regions with a relatively higher GDP than other regions. The manufacturing sector is one sector that depends on the capital resources of the sector. If capital resources are increased by investment, employment will also increase, and labor will be absorbed from the surrounding areas. This will lead to a reduction in inequality.

## 6. Concluding Remarks

The average inequalities between regions within the Western Indonesia Region (WIR) are higher than those in the Eastern Indonesia Region (EIR). Road infrastructure, electricity, and FDI are important factors affecting inequalities in the WIR region. These three factors have a significant impact on the reduction of inequalities in Indonesia. In the meantime, the electricity infrastructure and the number of workers in the EIR region are major factors affecting inequalities. Electricity infrastructure has a positive impact on inequalities, while the labor force

variable hurts regional inequalities. Interestingly, there is a difference in the impact of electricity infrastructure on inequality on the Indonesian Stock Exchange and East Indonesia. At WIR, electricity infrastructure hurts inequalities. At the same time, the EIR has a positive effect on inequality.

Based on the above findings, several suggestions have been made to reduce the level of regional inequalities. First, the development of infrastructure policies aimed at reducing inequalities in East Indonesia focuses on increasing electricity distribution. This development will increase inequality in the early stages and reduce inequality if development takes place on a sustainable basis.

Second, the Government of Indonesia needs to encourage the creation of new jobs to increase employment opportunities to maximize the workforce available in each region of Indonesia. Also, regulations need to be put in place to ensure that employment is concentrated in urban areas or Java and Bali and rural areas and areas outside Java so that labor can be optimally absorbed. Lastly, the Government of Indonesia also needs to implement policies that encourage investment, particularly in less developed regions, so that the economy is more developed and inequalities between regions are reduced.

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