Analysis of Spreading Investment Pattern in Central Java

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Abstract

The purpose of this research is to analyze the shifting pattern of spreading investment that occurs in Central Java from 2015-2019. This will also classification which area is still low on investment in Central Java in 2019. Furthermore, the research will reveal the factors that affect the spreading of investment in Central Java. The variables used in this research are PMA and PMDN investment, workforce, Consumer Price Index, Regional Minimum Wage and Tax. This research uses data cross-section and time series from 2015 to 2019 that came from DPMPTSP Central Java, Bappenas, and BPS. The method for this research is Entrophy Theil Index, Klassen Typology and Regression.

Keywords: Investment, PMA, PMDN, Entropy Theil Index, Klassen Typology


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INTRODUCTION

One of the efforts carried out by the government in improving the standard of living of people. Indonesia has continued to make efforts in various sectors in the last decades of development. Having a wide geographical area and various existing resources diversity is not only an advantage for this agrarian country, but also creates inequality in development in each region. An inequality problem is a natural problem experienced by a country, even developed countries. For this reason, the government as the highest authority in policy is expected to suppress problems as small as possible.

In economics, there are various tools that can be used to help analyze inequality, one of which is the Index Williamson (Sjafrizal, 2008). in his book reveals that one of the tools commonly used to measure the phenomenon of inequality in development between regions is the Index Williamson. According to the data in the image above, it can be concluded that the economic growth of Central Java Province has not been accompanied by economic equity or in other words inequality has occurred.

In theory, the movement on the Williamson Index will be in a different direction from the movement of economic growth in the area. However, in Figure 1 the graph of changes in the Williamson Index tends to be parallel or in line with changes in economic growth. This phenomenon may occur as a result because only a small number of regions have high levels of economic growth so when there is an increase in economic growth in general, Central Java has not been able to reduce the value of the Williamson index. This condition is certainly not in accordance with the direction of national economic development which wants to achieve equitable distribution of the people's economy.

Investment is considered one of the important factors in driving the economy. This condition is further clarified through various kinds of literature from classical neoeconomic theory to contemporary economic theory (Sarungu, 2008). Until now there has been a lot of literature that proves that the role of investment in giving an impact on the economy is very large.

It can be simply described that the amount of incoming investment is positively proportional to economic growth in Central Java. Investment growth in terms of both PMDN and PMA from year to year shows a positive impact on economic growth in Central Java. In the process, it shows how important investment is in encouraging the acceleration of economic growth in Central Java. The progress of
investment that has been running can be seen on figure 2.

![Figure 2](image)

**Figure 2.** GDP Per Capita, Realization of Domestic Direct Investment and PMA Central Java in 2015-2019

Source: Central Java BPS 2021, processed

Figure 2 shows the development of the value of GRDP per capita, and the realization of domestic and foreign investment in Central Java in the 2015-2019 period. The development of these three aspects seems to have a positive trend throughout the 2015-2019 period. This condition is in accordance with what was previously stated by Maryaningsih that investment has a role in influencing economic growth conditions.

One way that can encourage economic growth in underdeveloped regions to reduce the gap in inequality is through investment. Several experts have proven through their research that investment plays a significant role in driving the economic growth of a region. Inequality in investment is a problem that needs to be studied because it can hinder the equitable distribution of regional development in particular and national development in general. The multiplier effect resulting from investment can encourage the regional economy and increase the prosperity of the community (Restiatun, 2009). The purpose of this research is to analyze the shifting pattern of spreading investment that occurs in Central Java from 2015-2019.

**RESEARCH METHODS**

This type of research uses quantitative methods. The data used is panel data which includes time series data from 2015-2019 and a cross-section of 35 Regencies/Cities in Central Java. The variables used in this study are investment realization in Central Java, population, labor, human development index, consumer price index, regional minimum wage, and tax revenue. The data in this study were sourced from Central Java DPMPTSP, Bappenas, and BPS.

To find out how the pattern of investment spread in Central Java, researchers used the Entropy Theil Index method, the Entropy Theil Index in previous studies was used by JJ. Sarongu (2008) found the pattern of spatial distribution in Indonesia. Klassen typology to classify which areas are still under underinvestment. Then proceed with using the regression method to find out what factors influence the spread of investment in Central Java.

According to Sjafrizal (2008), the use of the Theil Index as a measure of inequality has certain advantages. The advantage of using Theil’s Entropy is that it can simultaneously calculate inequality within regions and between regions, so that the scope of the analysis is quite
broad. The coefficients of T and L are calculated using the following formula (Sarungu, 2008):

\[ T = \frac{1}{nU^*} \sum^n_{i=1} Y_i \ln \left( \frac{U_i}{U^*} \right) \]  

\[ L = \frac{1}{n} \sum^n_{i=1} \ln \left( \frac{U_i}{Y_i} \right) \]  

Where \( Y_i \) is investment per capita region \( i \) (\( i = 1,2,3,...,n \)), \( n \) is number of observation areas, \( U^* \) is average investment per capita and Ln is normal logarithm. According to Bappeda (2017) Klassen’s typology is an analytical technique that can be used to describe the pattern and structure of the regional economy.

This technique can also group Regencies/Cities within provinces according to their growth structure. According to experts, Klassen’s typology analysis generally has two main indicators to determine regional classification, namely economic growth and income or gross regional domestic product (GRDP) per capita.

However, in this study, the indicator used as the horizontal axis is economic growth and on the vertical axis investment is used. There are four typologies that explain the position of an area in the Klassen Typology analysis, that is:

- Quadrant I: Developed regions are growing rapidly (high growth and high investment), regions that have growth and investment rates higher than the regional average.
- Quadrant II: Regions that are developed but depressed (low growth but high investment), regions that have a low growth rate but have investment above the regional average.
- Quadrant III: Areas with high growth but low investment potential, areas that have a high growth rate, but have low investment below the regional average; Quadrant IV: Relatively underdeveloped regions (low growth and low investment), regions that have low growth rates and investment below the regional average.

The regression model of this study can be written in the form of a general function statement as follows:

\[ Y = X_1, X_2, X_3, X_4, X_5, X_6 \]  

Systematically from this function, the regression equation model can be derived as ensuing:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \]  

Where \( Y \) is PMA/PMDN investment, \( X_1 \) is work force, \( X_2 \) is GDB, \( X_3 \) is HDI, \( X_4 \) is Regional Minimum Wage, \( X_5 \) is Consumer Price Index, \( X_6 \) is Tax, \( \varepsilon \) is Error term and \( \alpha \) is Intercept.

Then further regression analysis is used to determine what factors affect the investment. The analytical model used in this study is multiple regression analysis using experimental study methods. The experimental study method is the only research method that tests hypotheses regarding causal relationships.

To determine the factors that influence the spread of investment, the researchers divided into 2 models, namely the PMA model for the dependent variable of PMA investment and the PMDN model for the dependent variable of PMDN investment.

RESULTS AND DISCUSSION

Investment distribution data processing based on Theil Entropy Index analysis. The value of Theil’s Entropy Index, which is greater in value or closer to 1, can
be interpreted as the more unequal the distribution (more converging) and vice versa when Theil’s Entropy Index is getting smaller or closer to zero, the more spread it is. The results of the data analysis can be seen in figure 3.

In figure 3 the coefficient value of the entropy theil index in the 2015-2019 period looks to fluctuate with a downward trend. The distribution pattern as shown in Figure 3 shows that the distribution pattern has a tendency to spread.

In Figure 4 the coefficient value of the entropy theil index in the 2015-2019 period shows a downward trend. This kind of distribution pattern forms a pattern which initially tends to be concentrated and then turns into a tendency to spread. From the data in Figure 4, it can be concluded that the spread of FDI investment between Regencies/Cities in Central Java Province is no longer concentrated in a few Regencies/Cities.

The pattern of distribution of investment in Central Java Province between Regencies/Cities in the 2015-2019 period tends to spread, both in domestic investment and foreign investment. The coefficient value on Theil’s Entropy Index which is getting further away from the number 1 indicates a pattern of spread that tends to spread. This situation is quite good because investment as a driver of economic development is expected to accelerate the wheels of the economy in various regions.

The pattern of distribution of PMDN investment that occurs in several areas of inter-regional cooperation in Central Java Province still shows a pattern that tends to be concentrated. The Purwomanggung area and the Bregasmalang area are two areas with a pattern of spread of domestic investment that tends to spread. The Barlingmascakeb, Subosukowonosraten, Banglor, Petanglong, Kedungsepur, and Wanarakuti areas tend to be concentrated in several Regencies/Cities within the inter-regional cooperation area.

Similar conditions also occur in the distribution pattern of PMA investment, where the distribution pattern of investment that occurs around inter-regional cooperation in Central Java Province still shows a pattern that tends to be concentrated. The
Wanarakuti area is the only area that has a pattern of spread of PMA investment that tends to spread, whereas other areas still tend to be concentrated in a few Regencies.

**Table 1. Results of the PMDN model regression**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>-32115854.947</td>
<td>29819657.078</td>
<td>-1.077</td>
<td>.283</td>
</tr>
<tr>
<td>Tenaga Kerja</td>
<td>2.301</td>
<td>8.552</td>
<td>.025</td>
<td>.788</td>
</tr>
<tr>
<td>PDRB</td>
<td>2.027</td>
<td>.565</td>
<td>.312</td>
<td>.000</td>
</tr>
<tr>
<td>IPM</td>
<td>4170.052</td>
<td>3771.450</td>
<td>.100</td>
<td>.270</td>
</tr>
<tr>
<td>UMR</td>
<td>-190</td>
<td>1.144</td>
<td>-.012</td>
<td>.869</td>
</tr>
<tr>
<td>IHK</td>
<td>309.404</td>
<td>394.039</td>
<td>.057</td>
<td>.433</td>
</tr>
<tr>
<td>Pajak</td>
<td>-3.509E-7</td>
<td>.000</td>
<td>-.002</td>
<td>.975</td>
</tr>
</tbody>
</table>

R Square = 0.357

Source: SPSS 25 Output Results, processed

The PMDN model regression equation is used to determine the spread of investment with the value of the domestic investment as the dependent variable. The results of the PMDN model regression can be explained in table 1. From the results of the PMDN model regression equation in table 3, it can be derived into the following equation model:

\[
\text{PMDN} = -32115854.947 + 2.301 \times \text{Tenaga Kerja} + 2.027 \times \text{PDRB} + 4170.052 \times \text{IPM} + 190 \times \text{UMR} + 309.404 \times \text{IHK} - 3.509E-7 \times \text{Pajak}
\]

The results of this study are in accordance with the theory of regional inequality, Hirchman in Sjafrizal (2008: 127) asserts that the trickle-down effect will occur when an area has reached the maturity stage, then polarization will begin to occur where a central center appears in the surrounding secondary area and regional areas also emerge. - suburbs. The polarization effect occurs because of the disparity between developed and underdeveloped regions. Based on table 3, the value of $\rho$ of the PMDN model in this study is 0.357. This means that PMDN investment as the dependent variable can be explained by 35.7% by the model while the other 64.3% is explained by other factors outside the research model.

The F-stat in this study is 4.101 with a probability of 0.017302. This value is significant at the confidence level of 5% or 0.05, so in this study, it can be seen that the variable that has a significant effect on the dependent variable or PMDN investment is the GDP variable. The PMA model regression equation is used to determine the spread of investment with the value of PMA investment as the dependent variable. The PMA model regression equation can be explained in table 2 the results of the PMA model regression.

Based on table 4, the value of $\rho$ of the PMA models in this study is 0.370. This means that FDI investment as the dependent variable can be explained by 37% of the
model while the other 63% is explained by other factors outside the research model. The F-stat in this study is 0.29 with a probability of 0.929. This value is significant at the confidence level of 5% or 0.05, so in this study, it can be seen that the variables that significantly influence the dependent variable or FDI investment are the UMR and CPI variables.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-4454.707</td>
<td>289254.188</td>
<td>-.015</td>
</tr>
<tr>
<td></td>
<td>Tenaga Kerja</td>
<td>.048</td>
<td>.153</td>
<td>.157</td>
</tr>
<tr>
<td></td>
<td>PDRB</td>
<td>.001</td>
<td>.017</td>
<td>.039</td>
</tr>
<tr>
<td></td>
<td>IPM</td>
<td>-1.703</td>
<td>9.541</td>
<td>-.053</td>
</tr>
<tr>
<td></td>
<td>UMR</td>
<td>.000</td>
<td>.002</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>IHK</td>
<td>.851</td>
<td>10.837</td>
<td>.026</td>
</tr>
<tr>
<td></td>
<td>Pajak</td>
<td>-2.676E-6</td>
<td>.000</td>
<td>-.239</td>
</tr>
</tbody>
</table>

Source: SPSS 25 Output Results, processed

From the results of the PMA model regression equation in table 4, it can be derived into the following equation model:

\[
PMA = -4454.707 + 0.048 \times \text{Tenaga Kerja} + 0.001 \times \text{PDRB} - 1.703 \times \text{IPM} + 0.000 \times \text{UMR} + 0.851 \times \text{IHK} - 2.676E-6 \times \text{Pajak}
\]

**CONCLUSION**

The pattern of distribution of PMDN investment that occurs in several areas of inter-regional cooperation in Central Java Province shows a pattern that tends to be concentrated. Most of the regional areas have a tendency for a concentrated pattern of FDI investment spread, only the Wanarakuti area has a spreading pattern of FDI investment with a tendency to spread.

The classification of regions having an investment value below the average investment value in Central Java is 29 regencies/cities that lack PMDN investment and 32 regencies/cities that lack FDI investment. There are about 8 (eight) regions that lack both PMDN investment and PMA investment, namely the Regency Magelang, Regency Wonogiri, Regency Grobogan, Regency Blora, Regency Kudus, Regency Temanggung, Regency Pekalongan, Magelang City.

There is one factor that significantly influences the spread of investment in the PMDN model partially or jointly, namely the
GRDP variable. Then in the PMA model there are 2 independent variables that have a significant effect on FDI investment as the dependent variable, either partially or jointly. These variables are the UMR and CPI variables.

REFERENCES


