Uncovering The Spatial Variation of Factors Influencing Economic Growth: Empirical Evidence from East Java

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ABSTRACT

Inequality in economic growth across regions often reflects structural imbalances and the limited effectiveness of current development policies. Thus, it is essential to investigate the factors that influence regional growth dynamics. Economic growth is defined as the change in income and the production of goods and services within a specific region or country over a designated period. The varying levels of economic growth, measured by Gross Domestic Product (GDP), are expressed at constant prices during a defined timeframe. This research aims to analyze the impact of Profit-Sharing Funds (DBH), labor, and Gross Fixed Capital Formation (PMTB) on economic growth in East Java. The analysis employs Geographically Weighted Panel Regression (GWPR) to assess how each independent variable influences the dependent variable across various districts and cities in East Java. The findings reveal three regional classifications. The first classification includes regions where none of the predictor variables significantly affect economic growth, which applies to 37 districts including Trenggalek. The second classification identifies areas where LABOR does not serve as a significant predictor variable in the same 37 districts and cities across East Java. Finally, the third classification highlights regions where Profit Sharing Funds (DBH) are significantly relevant to economic growth, with the exception of Trenggalek. Additionally, Gross Fixed Capital Formation (PMTB) is identified as a significant variable for economic growth in the districts of Lumajang, Jember, Bondowoso, Situbondo, Probolinggo, Pasuruan, Sidoarjo, as well as Probolinggo City and Pasuruan.

1.Introduction

Economic development is a form of effort to develop and improve the quality of the economy in a region within a specific period of time. According to Surahmi (2019), economic development is a continuous activity carried out to improve conditions related to a region's economy. The benchmark that makes economic development successful is whether efforts to increase economic growth can also be achieved. Economic growth is a change in income and production of goods and services in a region or country within a specific period. The high and low levels of economic growth can be seen from the Gross Domestic Product (GDP) rate at constant prices prevailing over a particular period (Yuniarti et al.,2020). According to Adam Smith's theory, economic growth can be formed by the population and output results, which include natural resources, capital accumulation, and technology. However, this is contrary to David Ricardo's theory that having a large workforce will reduce wages, reducing purchasing power, thereby inhibiting aggregate demand. Paul Samuelson also opposed Adam Smith's theory regarding diminishing marginal productivity, which states that in the long term, with continuous additions to production factors such as capital and labor, productivity results will decrease and obstruct economic growth.

Based on data from BPS, the East Java region recorded that the average economic growth rate from 2016 to 2021 was 3.93%. Apart from that, BPS also noted that the economic growth figures in 2016 for each district/city in East Java showed a trend with an increase that was not significant or could be said to be stagnant. This can be seen from the average district/city economic growth in 2016 of 5%, while in 2021, there was a decline in economic growth rates caused by the COVID-19 pandemic, with the majority of economic growth rates at 3%. Batu City and Surabaya City are the highest contributors to economic growth in the East Java economy. These two cities contribute to East Java's economic growth almost every year, namely 6%, but this has fallen to 4% due to the pandemic. The differences in the economic growth rate of each district/city in East Java are due to differences in potential in terms of resources and policies of their respective regional autonomy.

Regional autonomy helps optimize regional development. The optimization can be realized with Profit-Sharing Funds (DBH). In the Tiebout model, decentralization contributes to economic growth. The greater the DBH, the more it will influence economic growth (Dewi et al., 2015). However, according to research by Mahi (2001) in (Aziz, 2016), an increase in DAU in the form of DBH when there is an increase will reduce economic growth, which causes economic inequality. This is in accordance with notes from the Ministry of Finance's DJPK that the detailed allocation of revenue sharing funds for East Java for 2016-2021 is an average of 4 billion, which is still low compared to other provinces, for optimizing regional economic growth.

According to Solow's theory, factors that can influence the output of economic growth are the quality and quantity of labour. This aligns with Todaro's (2003) and (Mukamad et al.,2017) opinion that increasing power will increase work productivity, affecting economic growth. However, this statement does not align with the research results from Dumairy (1997) in (Irhamni, 2018)that many workers negatively impact the economy if adequate employment opportunities are not provided. Job opportunities arise if there is investment in them. One form of investment is Gross Fixed Capital Formation (PMTB). Based on Harrod-Domar's theory, PMTB can increase economic productivity. This is not in line with research from (Sulistiawati,

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2012), where PMTB will be able to reduce economic productivity because PMTB will only be centered on one point and will not precisely target the needs of the region. This statement is in accordance with data from BPS, which shows that the highest number of PMTB in districts/cities in East Java is only centered on specific points, namely Sidoarjo and Malang.

From the background explained above, East Java's economic growth rate from 2016 to 2021 is still low, which shows that the form of policy from the East Java government is still not optimal regarding economic development. This is reflected in the economic growth rate of East Java districts/cities, which is still stagnant at around 5% at its maximum. Therefore, it is necessary to know the factors that cause the level of economic growth in East Java to remain low to make policies to optimize economic growth in East Java Province. Although numerous studies have examined regional economic growth determinants, most still rely on conventional econometric approaches that assume spatial homogeneity across regions. This assumption ignores that economic growth dynamics often vary significantly between districts and municipalities due to differences in resource endowments, infrastructure, and local policy effectiveness. For this reason, researchers use Geographically Weighted Panel Regression (GWPR) analysis compared to other analytical tools because GWPR can determine the distribution of independent variables that influence and do not influence the dependent variable in every district/city in East Java with a p-value that differs.

2. Literature Review

Economic Growth

According to (Nujum et al., 2019), economic growth measures economic development. According to the classical school, Adam Smith, in his book entitled "An Inquiry into the Nature and Causes Weakness of Nations (1776), states that the factors that can influence economic growth consist of population growth factors and output factors. The output factors consist of natural resources, technology, and capital accumulation. According to Adam Smith, population growth will increase output, influencing economic movements. Meanwhile, output results can influence economic growth if Human Resources can optimize available Natural Resources for productivity.

Profit Sharing Fund

In the Tiebout model, decentralization is more optimal in regional development. Funds given to regions are seen as more effective in their allocation because they recognize the fulfilment of community needs and the development of their own regional economy. The form of funds the centre provides to regions can be DBH, which comes from APBN revenues based on percentage figures. Economic growth can increase from the services the government provides for community needs(Putu Irvan et al., 2016). Based on this description, the government services referred to are the allocation of funds in the form of profit-sharing funds for the effectiveness of people's society needs.

Labor

Labor is an important element in producing goods or services and drives economic activities (Izzah et al.,2021). According to Robert M. Solow in his article entitled "A Contribution to the Theory of Economic Growth", the content of the article is one of the things that can

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influence economic growth in the long term, namely, labor. In Solow's theory, labor includes the number and productivity of workers who can contribute to economic growth. According to (Sandhika et al., 2012), labor has its own influence on a region's economy due to economic productivity, which will influence the economy.

Gross Fixed Capital Formation (PMTB)

GFCF is a form of investment in the form of capital goods. Harrod-Domar's theory focuses on two functions of capital formation, hoping that capital formation is a form of financial contribution that can increase production capacity and consumer demand. In other words, GFCF is a production factor used by companies to increase output. According to (Sunny,2016), capital formation in economic growth is an important determinant because a capital increase can increase the capital stock, ultimately increasing production productivity and economic growth. According to (Arum et al., 2022), the model used to identify spatial effects in panel data is the Geographically Weighted Panel Regression (GWPR). The researcher analyzed the factors that influence economic growth in West Java. The study's findings indicate that the variables affecting economic growth are health facilities and government expenditure.

3. Research Method

This research uses the Geographically Weighted Panel Regression (GWPR) method using secondary data from the Central Statistics Agency (BPS) of East Java Province and several reference sources related to the variables used. This research employs three variables, namely Profit-Sharing Funds (DBH), labor, and Gross Fixed Capital Formation (PMTB), across 37 districts/cities in East Java. The study population is East Java Province, while the sample consists of 37 districts/cities within East Java from 2016 to 2021. Geographically Weighted Panel Regression (GWPR) is a statistical analysis that uses latitude and longitude weighting of the research location. GWPR is a panel regression model that looks at the geographical conditions in it(Ananda et al., 2023). These methods are important to capture different p-values from independent variables that influence and do not influence the dependent variable in every district/city in East Java.

Model Specifications Geographically Weighted Panel Regression (GWPR).

$$GROWTH_{it} = \beta_0(u_{it}, v_{it}) + \beta_1(u_{it}, v_{it})DBH_{it} + \beta_2(u_{it}, v_{it})LABOR_{it} + \beta_1(u_{it}, v_{it})PMTB_{it} + \varepsilon_i \quad \text{..... (1)}$$

GROWTH : states economic growth in regency/City (i) in period (t),
(ui, vi) : coordinates geographical location (longlat) in Regency/City (i) in period (t),
DBH : Profit Sharing Fund (DBH) in regency/City (i) in period (t),
LABOR : workforce in Regency/City (i) in period (t),
PMTB : Gross Fixed Capital Formation in regency/city (i) in period (t),
β0 : intercept in Regency/City (i) in period (t),
βk : parameter in Regency/City (i) in period (t) which is related to the independent variable,
t : times series,
i : cross section,
εi : error term.

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GWPR Parameter Model Estimation

GWPR estimation using Weighted Least Squares (WLS) by giving different weights to each location. The estimated parameters of the GWPR are βk (ui, vi) for each variable k at the observation location i, namely as follows:

$$\hat{\beta} u_i, v_i = [X^T W(u_i, v_i)X]^{-1} X^T W (u_i, v_i)Y \quad \text{.....(2)}$$

With matrix notation, the parameters that can be used are:

$$\beta \begin{bmatrix} \beta_0(u_1, v_1) & \beta_1(u_1, v_1) & \beta_p(u_1, v_1) \\ \vdots & \vdots & \vdots \\ \beta_0(u_n, v_n) & \beta_1(u_n, v_n) & \beta_p(u_n, v_n) \end{bmatrix} \quad \text{.....(3)}$$

Weighted GWPR Model

GWPR weighting is a weighting value that represents the location of one observation relative to another. According to (Rahayu, 2017), a fixed kernel that is:

a. *Gaussian* $W_{ij} = \exp\left(-\frac{1}{2}\left(\frac{d_{ij}}{a}\right)^2\right)^2$ .....(4)

b. *Bisquare* $W_{ij} = \begin{cases} \left(1 - \left(\frac{d_{ij}}{a}\right)^2\right)^2, & \text{for } d_{ij} \leq a \\ 0, & \text{for others} \end{cases}$ .....(5)

c. *Tricube* $W_{ij} = \begin{cases} \left(1 - \left(\frac{d_{ij}}{a}\right)^3\right)^3, & \text{for } d_{ij} \leq a \\ 0, & \text{for others} \end{cases}$ .....(6)

dij shows the location distance between location (i) and location (j) obtained from the Euclidean distance *(dij)2(ui-uj)2 + (vi-vj)2*, where u is the latitude, v is the longitude, and a is the bandwidth/smoothing parameter. To get optimum bandwidth, we can use Cross-Validation (CV) with the minimum value using the formula:

$$CV = \sum_{i=1}^{n} [\bar{y}_i - \hat{y} \neq i\ (a)]^2 \quad \text{.....(7)}$$

$\hat{y} \neq i$ (a) represents the estimate $\hat{y}$ dengan e with bandwidth from location u_i-v_i dan $\bar{y}_i$ is the average of dependent variable over time (t) at observation location (i).

GWPR Model Test

Model testing is required for both GWR and GWPR models. From testing the GWPR model there are several hypotheses including:

$H0 : \beta k(ui, vi) = \beta k$ for each $k = 1, 2, \dots, p$ and $i = 1,2, \dots, n$ (there is no significant difference between the panel data regression model and GWR- Panel)

$H1$ there is at least one $\beta k(ui, vi) \neq \beta k$ for each $k = 1, 2, \dots, p$ and $i = 1,2, \dots, n$ (there is a significant difference between the panel data regression model and GWR-Panel)

The statistical test formula used in model suitability is:

$$F_{test} = \frac{SSE(H_1)/df_1}{SSE(H_0)/df_2} \quad \text{.....(8)}$$

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Significance level 0,05, *SSE* (H_1) $= y^T(1-H)^T(1-L)y$, $SSE(H_0) = y^T(1-H)\,y$, *where* $H = (X^TX)^{-1}X^T$\, $df_1 = \frac{\partial_1^2 1}{\partial_2}$, where $\mathbf{\partial}_1 = \mathrm{tr}([(1-L)^T(1-L)^i])$, i= 1,2,3,4…, df_2= n-p-1, *I*= identity matrix n x n, $_L$= projection matrix for the GWPR model.

H_0 rejected when Ftest > $F_{1-\alpha;df}1;df2$
H_1 rejected when Ftest > $F_{1-\alpha;df}1;df2$,Distribution of F_{test} with distribution F degrees of freedom df_1, df_2.

Partial test of the parameters is as follows:

$$SE[\hat{\beta}_K(u_1,v_1)] = \sqrt{Var[\hat{\beta}K\ (u_1,v_1)]} = \sqrt{CC^T\sigma^2}$$
$$C = [(X'W(u_1,v_1)X]^{-1}\ X^T\ W(u_1,v_1)$$
$$and$$
$$\sigma^2 = \frac{\sum_{i=1}^{n}(Y_1-\hat{Y}_i)^2}{dk_2} \quad \text{..... (9)}$$

Then proceed with statistical tests:

$$T_{test} = \frac{\hat{\beta}K(u_1,v_1)}{\hat{\sigma}\sqrt{C}_{kk}} \quad \text{.....(10)}$$

C_{kk} is diagonal element diagonal ke-k of matrix $C_iC_i^T$
H_0 rejected when $|T_{test}| \geq t_{\frac{\alpha}{2}\cdot df}$
H_1 rejected $|T_{test}| \leq t_{\frac{\alpha}{2}\cdot df}$ the distribution of T allow t distribution degrees of freedom

$$df = \frac{\partial_1^2}{\partial_2} \text{ dan } \hat{\sigma} = \frac{SSE(H_1)}{\partial_1} \quad \text{.....(11)}$$

Selection of the Best Model

According to Quraini, A (2014), the model suitability test or goodness of fit uses the R2 or model determination coefficient from GWPR. The formula used is:

$$R^2(u_1,v_1) = \frac{TSS-RSS}{TSS} = \frac{\sum_{j=1}^{n} W_{ij}\ (Y_i-\bar{Y}_i)^2}{\sum_{j=1}^{n} W_{ij}\ (Y_i-\bar{\hat{y}}_{it})^2} \quad \text{.....(12)}$$

4. Results and Discussion

In the Geographically Weighted Panel Regression (GWPR) model, the first step is determining the global regression, which will later be compared with the GWPR model.

Table 1. Global Regression Results (REM)

Variable	Coefficient	*St. Error*	t-statistics	*P-value*
DBH	0,0054321	0,0032144	5,3002	0,0000001157
LABOR	-0,049853	0,0010249	-1,1003	0,271121
PMTB	0,0000024240	0,045309	-0,6961	0,48635
Constant	6,273127	3,228139	1,94	0,052
R^2	11,88%			

Source: Data processed

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Table 1 above shows which independent variables significantly affect economic growth in 37 districts/cities in East Java. Among the three independent variables influencing economic growth is the Profit-Sharing Fund (DBH) variable with a p-value<0.05. From the table above, the value of R2, or the coefficient of determination, is 11.88%. This can be illustrated when one unit's economic growth increases in the following observation, i, and time range, influenced by independent variables. On the other hand, it will also be influenced by other variables by 88.12%.

After getting the global regression, the next step is to estimate the GWPR model, which can be done by determining the bandwidth best or optimum. Bandwidth. The optimum is obtained from the cross-validation (CV) value, which is the minimum of the weighting function. The weighting function used in the GWPR analysis is a fixed kernel function consisting of bisquare, Gaussian, and tricube.

Table 2. Bandwidth and CV Values

Kernel Weighted Function	Bandwidth	CV Value
Biscuare	0,1971393	1157,86
Gaussian	0,2110954	1154,426
Tricube	0,1577494	1165,731

Source: Data processed

The table above shows each weighting function's value band width and CV. Results analysis shows that the weighting function Gaussian is the best because it has an optimum CV value compared to the weighting function Bisquare or Tricube. If the selected kernel weighting function is Gaussian, then the bandwidth value in each district/city in East Java will also be different. Bandwidth: These different values will later function to estimate the parameter values of the GWPR model at each observation location. This difference is only for each observation location, but it will be the same for each year because GWPR uses panel data.

From the previous explanation, each location's bandwidth value will differ. Table 3 shows the bandwidth of each of the 37 different districts/cities in East Java.

Table 3. Bandwidth Values at Each Observation Location

District/city	Bandwith	District/city	Bandwith
Pacitan	1,8730785	Magetan	1,5685564
Ponorogo	1,4278987	Ngawi	7,5806168
Trenggalek	1,3171967	Bojonegoro	1,2847007
Tulungagung	1,1598607	Tuban	1,3523702
Blitar	1,9270666	Lamongan	1,0833816
Kediri	1,1200460	Gresik	1,1598607
Malang	1,1060164	Bangkalan	1,2360812
Lumajang	1.2583927	Sampang	1,3934353
Jember	1.7136999	Pamekasan	1,5718718
Banyuwangi	2,3778794	Sumenep	2,0111132
Bondowoso	1,8058038	Kota Kediri	1,1179369
Situbondo	1,9902165	Kota Blitar	1,0652461
Probolinggo	1,1850034	Kota Malang	1,0991365
Pasuruan	1,0177035	Kota Probolinggo	1,1874952
Sidoarjo	0,9746441	Kota Pasuruan	1,0341904
Mojokerto	0,9499238	Kota Mojokerto	0,9499238
Jombang	0,9921423	Kota Madiun	101,2109900
Nganjuk	1,0514991	Kota Batu	1,0403756
Madiun	1,3897389		

Source: Data processed

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When the model has been formed for each region, it is necessary to carry out a partial test, which is used to determine the suitability (goodness of fit) of the GWPR model. Table 4 below shows that the P-value is <0.05. Thus, reject H0 at a significance level of 5%. From this information, the GWPR model has a good goodness of fit when compared with a model from global regression.

Table 4. GWPR Model Fit Test

F	F table	P-value	Results
9,995	3,27	3.464e-06	Tolak H_0

Source: Data processed

After the GWPR model becomes the best model, it is continued with another test, namely the significance test parameter. The significance test of the GWPR parameters aims to see which predictor variables influence the response variables in 37 districts/cities in East Java. Whether significant or not is seen from each observation location (uit, vit) < 0,05 or 5%.

The final step used in the GWPR model is model comparison of regression, global, and the model of Geographically Weighted Panel Regression (GWPR), aiming to find out which model is best for analyzing which predictor variables influence economic growth in East Java. After conducting analysis using R-Studio software, the global regression and GWPR models were compared, as described in Table 5 below.

Table 5. Comparison of Global Regression Models and GWPR

Model	R^2
GWPR	0,2110954
Global Regression	0,1188

Source: Data processed

The table above shows the value of R2 from the global regression model and GWPR. Comparison of the two models above shows that the GWPR model is better used to analyze independent variables on economic growth. This is proven by the R2 value of GWPR being greater with a value of 0.2110954 or 21.10% compared to the global regression model of 0.1188 or 11.88%.

From the significance parameter test, three regional classifications were obtained. The first classification with regional coverage has no predictor variables at all that have a significant effect on economic growth, the second classification is regions with insignificant labor variables in 37 districts, the third classification of regions has one variable that is significant on economic growth.

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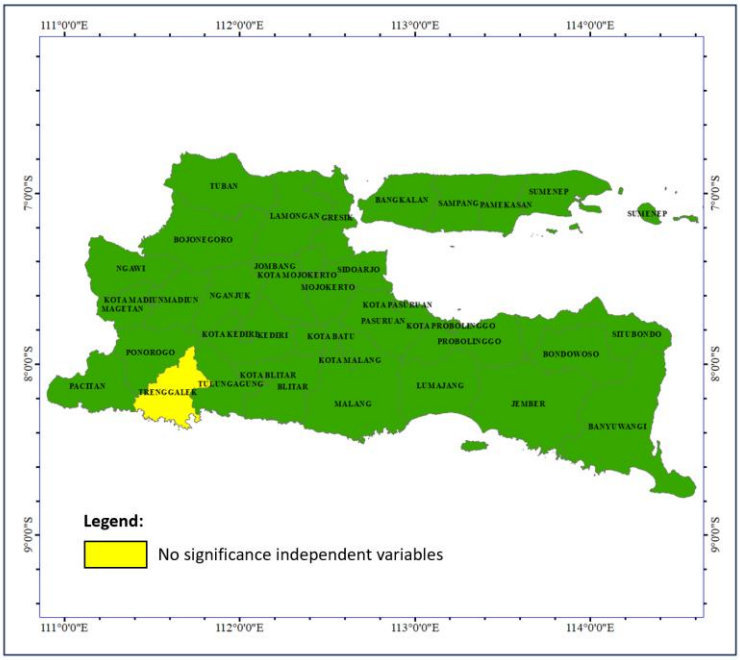

Figure 1. Map of 37 Regencies Based on Insignificant DBH, LABOR, and PMTB Variables

The yellow color of Figure 1 shows Trenggalek Regency; none of the three predictor variables is the same, which influences the region's economic growth. This is not in accordance with Adam Smith's theory that population growth factors influence economic growth in the form of labor. On the other hand, output factors in the form of Natural Resources (SDA), Profit Sharing Funds (DBH), and capital accumulation in the form of Gross Fixed Capital Formation (PMTB) can encourage economic growth in a region.

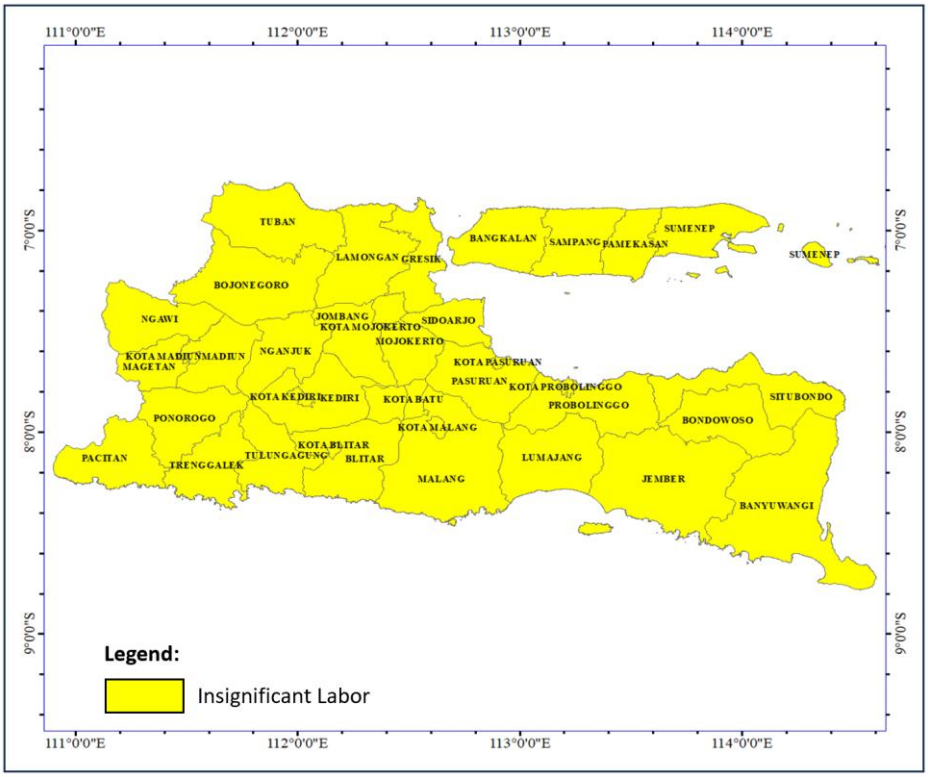

Figure 2. Map of 37 Regencies Based on Insignificant Labor Variables

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Figure 2 shows the second classification, which shows that the labor variable does not significantly influence economic growth in East Java, which is represented by the yellow color spread across 37 districts/cities. However, the manufacturing sector dominates the industry, such as the Petrochemical Industry in Gresik and Tuban Regencies, Panggung Electrical Citrabuana in Sidoarjo Regency, PT. Bangun Sarana Baja in Gresik Regency, Bengkel Karya Logam in Situbondo, and PT. Alim Ampuh Jaya Steel in Sidoarjo Regency. These manufacturing industries rely more heavily on investments in advanced machinery and technology rather than labor in their operations. As a result, they tend to reduce the use of labor in the production process. As a result, they reduce the use of labor in the production process. Based on the value of the Incremental Capital Output Ratio (ICOR), East Java above shows that the average is more than 5, which means it is more inclined towards Capital Intensive compared to Labor Intensive, which has an impact on reducing the productivity of the workforce and causing obstacles to economic growth.

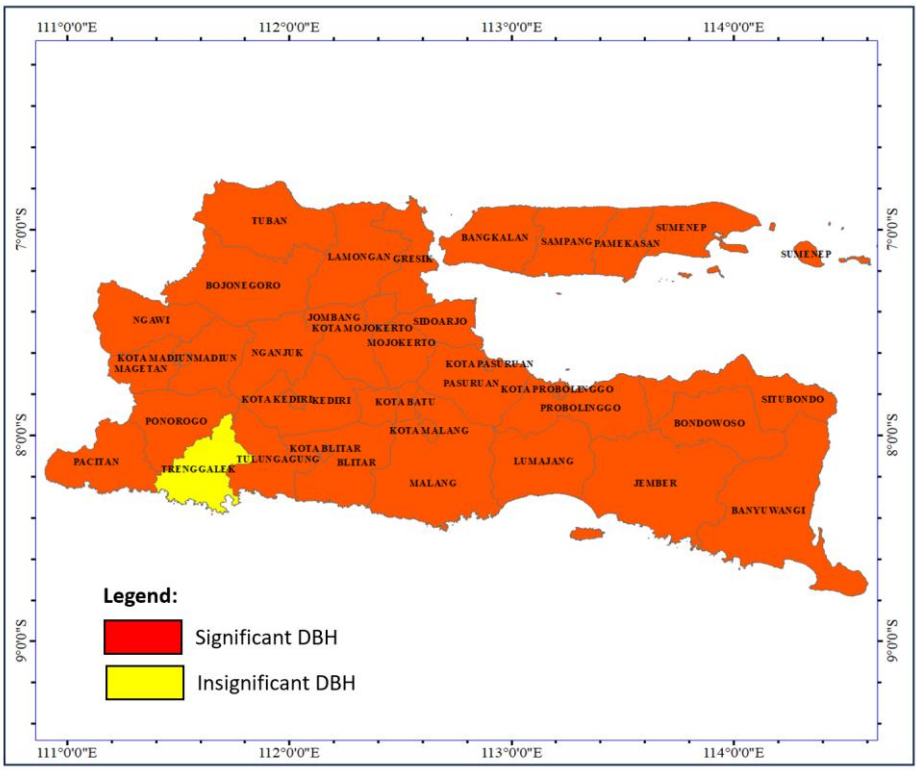

Figure 3. Map of 37 Regencies Based on Significant Profit-Sharing Fund (DBH) Variables

Based on DBH's significant distribution, 36 districts/cities in East Java are represented by the color orange. Regency/city Revenue Sharing Funds (DBH) have a positive and significant effect in Figure 3 spread across Pacitan Regency, Ponorogo Regency, Tulungagung Regency, Blitar Regency, Kediri Regency, Malang, Lumajang, Jember, Banyuwangi, Bondowoso, Situbondo, Probolinggo, Pasuruan, Sidoarjo, Mojokerto, Jombang, Nganjuk, Madiun, Magetan, Ngawi, Bojonegoro, Tuban, Lamongan, Gresik, Bangkalan, Sampang, Pamekasan, Sumenep, Kediri City, Blitar, Malang, Probolinggo, Pasuruan, Mojokerto, Madiun, Batu City. Sources of income from managing geothermal resources include those spread across significant areas where forestry and fisheries products are abundant enough to support economic growth, including the management of oil and natural gas such as the Cepu oil field (Bojonegoro Regency), Kangen field (Sumenep Regency), Tuban refinery (Tuban Regency), Cepu oil field (Bojonegoro Regency), and the Brantas oil field (border area of Tuban and Bojonegoro Regencies). The distribution of these oil fields has led to increased revenue from profit-sharing funds provided by the central government. This, in turn, enables each region to meet its own needs and contributes positively to the growth of its regional economy.

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The yellow color in Figure 3 shows that Profit Sharing Funds (DBH) do not significantly affect economic growth. The area is Trenggalek Regency. The DBH received by Trenggalek Regency could not influence economic growth because the source of income used to support its economic growth did not depend on DBH from the central government, but on other income, such as the trade sector.

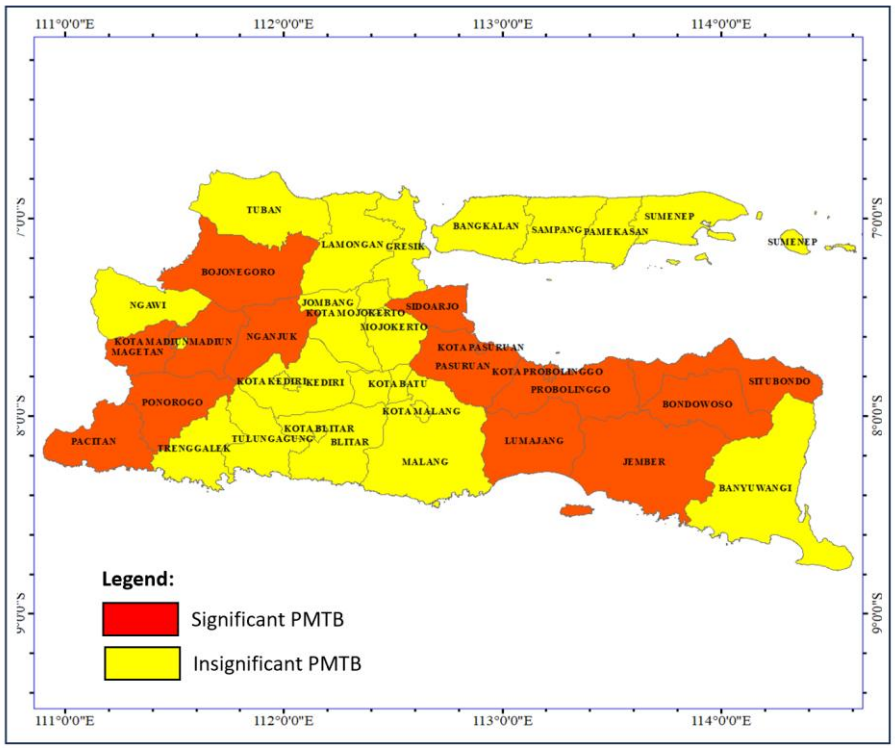

Figure 4. Map of 37 Regencies Based on significant Gross Fixed Capital Formation Variables

Based on the results of the analysis, this variable has two significant directions for economic growth. First, the Gross Fixed Capital Formation (PMTB) variable positively and significantly affects economic growth. Second, the Gross Fixed Capital Formation (PMTB) variable negatively and significantly affects economic growth. Of the 37 regencies/cities, the PMTB variable has a positive and significant effect on economic growth distributed in the districts of Lumajang, Jember, Bondowoso, Situbondo, Probolinggo, Pasuruan, Sidoarjo, Probolinggo City, and Pasuruan. Several districts/cities above PMTB have a positive and significant influence on economic growth, according to conditions in the field. This is because they are in the SIER industrial area (Sidoarjo Industrial Estate Rungkut), right in Sidoarjo Regency. It is also included in the PIER (Pasuruan Industrial Estate Rembang) area, which is located in Pasuruan Regency. The last industrial area is Safe n Lock (Sidoarjo Eco Industrial Estate) in Sidoarjo Regency. Industries in these districts/cities can also invite investment in the form of PMTB, which has an effect on increasing productivity activities and the movement of the regional economy and the economies of the surrounding regions.

Gross Fixed Capital Formation (PMTB), which negatively and significantly influences economic growth, spread to Pacitan, Ponorogo, Nganjuk, Madiun, Magetan, and Bojonegoro Regencies. Examining the regional conditions of the districts above, which negatively influence economic growth, has an area that is not too large. Apart from that, the leading sector of the district above is the agricultural sector, not industry, so that when investment comes in, it is not relevant to developing the potential of the leading sector; as a result, it has a destructive impact on the regional economy because it is not on target. Of the six regions with a negative and significant influence, only one district has a mining industry, but this cannot boost economic growth in the surrounding area.

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The yellow color in Figure 4 is the area coverage of the Gross Fixed Capital Formation (PMTB) variable, which does not significantly affect economic growth. The areas in yellow in Figure 4.8 above consist of Trenggalek, Tulungagung, Blitar, Kediri, Malang, Banyuwangi, Mojokerto, Jombang, Ngawi, Tuban, Lamongan, Gresik, Bangkalan, Sampang, Pamekasan, Sumenep, Kediri City, Blitar, Malang, Mojokerto, Madiun, Batu. The region is at a high level of competition in industries such as Sidoarjo and Pasuruan. Apart from that, geographical conditions and economic uncertainty make it difficult for investment in the form of PMTB to reach the region, so investment from PMTB does not significantly impact overall economic growth.

5. Conclusion

Based on the results of research that has been carried out using the approach Geographically Weighted Panel Regression (GWPR), it can be seen that the independent variables have different influences on economic growth in 37 districts/cities. The Profit Sharing Fund (DBH) variable has a significant effect spread across 37 regencies/cities of East Java except in Trenggalek Regency, the Labor Variable does not have a significant effect in all 37 regencies/cities of East Java, the Gross Fixed Capital Formation (PMTB) variable has a significant effect spread across the regencies Lumajang, Jember Regency, Bondowoso Regency, Situbondo Regency, Probolinggo Regency, Pasuruan Regency, Sidoarjo Regency, Pacitan Regency, Ponorogo Regency, Nganjuk Regency, Madiun Regency, Magetan Regency, Bojonegoro Regency, Probolinggo City, and Pasuruan City. Not significant in Trenggalek Regency, Tulungagung Regency, Blitar Regency, Kediri Regency, Malang Regency, Banyuwangi Regency, Mojokerjo Regency, Jombang Regency, Ngawi Regency, Tuban Regency, Lamongan Regency, Gresik Regency, Bangkalan Regency, Sampang Regency, Pamekasan Regency, Sumenep Regency, Kediri City, Blitar City, Malang City, Mojokerto City, Madiun City, and Batu City. With the results of this study, the GWPR method can serve as a reference for policymakers in formulating and determining optimal regional development policies that are aligned with the specific potentials of each district or city.

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