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Regional Disparities Analysis among Regencies and Cities in Indonesia 2015–2019

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Abstract:

This study aims to describe the trend and level of welfare disparity among regencies and cities in Indonesia in 2015–2019 by observing aspects of population, population growth, road length, human capital, exports, the number of MSMEs/Small Entrepreneurs and the inflation rate. The novelty of this research is that up to now, there has never been a study using neoclassical convergence to see the trend of convergence at the regency and city levels in Indonesia. Therefore, this study is the first research to reveal the trend of convergence at the regency and city levels in Indonesia. This study used the convergence method in neoclassical growth models with panel data regression analysis. The results found that the gap among regencies and cities in Indonesia was influenced by the number of population, the percentage of population growth in the length of asphalt/Pavel roads, human resources, net exports, the number of MSMEs/small entrepreneurs and inflation with a value of $R = 0.968$. This indicates that all factors studied play a role in influencing the magnitude of the disparity among regencies and cities in Indonesia.

Keywords: disparity, convergence, decentralization, neoclassical growth model.

2015–2019年印度尼西亚地区和城市之间的区域差异分析

摘要:

本研究旨在通过观察人口、人口增长、道路长度、人力资本、出口、中小微企业/小企业家的数量和通货膨胀率等方面来描述2015–

2019年印度尼西亚各县和城市的福利差距趋势和水平。这项研究的新颖之处在于，迄今为止，还没有一项研究使用新古典趋同来观察印度尼西亚摄政和城市层面的趋同趋势。因此，这项研究是第一个揭示印度尼西亚摄政和城市层面趋同趋势的研究。本研究采用面板数据回归分析的新古典增长模型中的收敛方法。结果发现，印度尼西亚地区和城市之间的差距受到人口数量、沥青/柏油路长度的人口增长百分比、人力资源、净出口、中小微企业/小企业家数量和通货膨胀的影响。R的值=0.968。这表明所研究的所有因素都在影响印度尼西亚地区和城市之间的差距幅度方面发挥了作用。

关键词: 差距、趋同、去中心化、新古典增长模型。

1. Introduction

Decentralization changed the regional constellation of Indonesia. For example, in terms of administration, it was revealed that in the last decade, Indonesia had given birth to 205 new autonomous regions, bringing the total number of autonomous regions in Indonesia to 524 autonomous regions consisting of 33 provinces, 398 regencies, and 93 cities. Moreover, the change in the government system from a centralized one to a decentralized one turned out to influence the gap in the level of community welfare between regions (Armstrong & Taylor, 2000). Therefore, the researchers suspect this also applies in Indonesia, where a gap in the level of welfare between regencies and provinces in Indonesia is changing. In economics, there are two different views with their respective reasons regarding the effect of decentralization on the level of community welfare between these provinces. First, public choice theory rooted in neoclassical schools argues that decentralization can increase the efficiency of resource allocation by better meeting the needs and preferences of residents, due to better knowledge of the needs and preferences of local governments. This gain in efficiency will be amplified by the mobility of the population who can choose to live in areas that best suit their preferences. Alternatively, Keynesian supporters argue that decentralization will reduce the capacity of the central government to use policies to reduce the effects of fluctuations in production and employment. Greater decentralization will reduce the efficiency in setting macroeconomic goals, will increase diffusion in the use of policy instruments and reduce the level of coordination between government bodies (Canaleta et al., 2004).

Considering that the two views mentioned have been proven by research results in various parts of the world, the followers of the above two schools of thought above dare to claim the truth of each theory. This shows that decentralization can increase or decrease the gap in welfare levels between regions at the district/city level within a province or the inter-provincial level. Until

now, no theory has been applied to the case of the gap in the level of community welfare between districts/cities within a province. This condition has attracted the attention of researchers to determine which view is more appropriate for the Indonesian case. Conducting this research is an important issue because without knowing which opinion is more appropriate, it will be difficult for the government to develop public policies in terms of reducing disparities in the welfare of the people between districts and cities in the country.

The gap in the level of welfare between provinces needs important attention according to (Armstrong & Taylor, 2000), the gap in the level of welfare between regions will cause: disappointment and dissatisfaction and maybe even resistance from people living in poor areas. Especially those who find it difficult to get a job and a decent living, because the situation is beyond their capabilities. Additionally, the economic costs are massive in rapidly growing urban areas due to excess demand for social infrastructure and public services, while in backward areas, social infrastructure and public services are not fully used.

By using data at the district/city level in all districts and cities (514 districts/cities), this study will use the convergence theory method in neoclassical school to see the value and trend of disparities among cities and districts in Indonesia.

2. Research Methods

This study uses a quantitative method on district-city-level data in Indonesia as the unit of analysis. The data used in the plan for the 2015–2019 period taken from the Central Statistics Agency (BPS), Bank Indonesia (Central Bank of Republic of Indonesia), Bappeda (Regional Planning and Development Office), and Balitbangda (Regional Research and Development Office) at the regency/city levels in Indonesia and field data collection in regency and cities. The model specification of the analysis conducted refers to Model Convergence. Barro and Sala-i-Martin (2004) define a model for estimating beta convergence with a

consideration for the condition of income balance level, rate of technological progress, and the time. If the condition of the equilibrium level of income and the speed of technological progress are the same for all regions, the income of all regions will be concentrated at the same level of equilibrium. This concept is known as absolute convergence.

Formula (2) will be used in this study to estimate the absolute convergence for districts/cities in Indonesia. Meanwhile, under the assumption that each city district has differences in the speed of technological progress and the level of income balance, this concept is known as conditional convergence. Here, several control variables can be adopted as a proxys for the difference in income balance. To verify the existence of conditional convergence, the model used is Formula (1):

$$\frac{1}{T} \cdot \log\left(\frac{y_{it}}{y_{i0}}\right) = r - \frac{1 - e^{-\beta T}}{T} \log y_{i0} + \frac{1 - e^{-\beta T}}{T} \cdot \log(\hat{y}_i^*) + u \quad (1)$$

where \hat{y}_i^* is the condition of income balance level; and r is the rate of technological progress, while T is the time. If the condition of the equilibrium level of income and the speed of technological progress are the same for all regions, the income of all regions will be concentrated at the same level of equilibrium. This concept is known as absolute convergence

$$\frac{1}{T} \cdot \log\left(\frac{y_{it}}{y_{i0}}\right) = \alpha - \frac{1 - e^{-\beta T}}{T} \log y_{i0} + u \quad (2)$$

Meanwhile, under the assumption that each regency/city has differences in the speed of technological progress and the level of income balance, this concept is known as conditional convergence. Here, several control variables can be adopted as proxys for the difference in income balance. To verify the existence of conditional convergence, the model used is:

$$\begin{aligned} \frac{1}{T} \cdot \log\left(\frac{y_{it}}{y_{i0}}\right) = & \alpha - \frac{1 - e^{-\beta T}}{T} \log(y_{i0}) + b_1 \frac{1 - e^{-\beta T}}{T} \log\left(\frac{DI_{it}}{y_{i0}}\right) \\ & + b_2 \log\left(\frac{1}{T-1} \sum_{t=0}^{T-1} P_{it}\right) + b_3 \log\left(\frac{1}{T-1} \sum_{t=0}^{T-1} RL_{it}\right) + b_4 \log(HC_{i0}) \\ & + b_5 \log\left(\frac{1}{T-1} \sum_{t=0}^{T-1} Exp_{it}\right) + b_6 \log\left(\frac{1}{T-1} \sum_{t=0}^{T-1} MSME_{it}\right) - b_7 \log\left(\frac{1}{T-1} \sum_{t=0}^{T-1} Inf_{it}\right) + u \end{aligned} \quad (3)$$

where:

y_{i0} - real per capita GRP at the initial year;

\log - population growth rate;

DI_{it} - domestic investment;

GE_{it} - government expenditure;

edu_{i0} - educational attainment at the initial year;

u - error term.

Under the assumption of diminishing marginal product of capital, neoclassical growth theory predicts that, in the long run income per capita between provinces will be at the same level. Beta coefficient in the initial log per capita GRP, $\log(y_{i0})$, is hypothesized to be positive. While still according to the same theory, it is predicted that per capita income growth will be inversely proportional to population growth. Population growth is hypothesized to be negative. Many empirical

studies have shown that investment is an engine of income growth. Therefore, that domestic investment (DI-it) hypothesized positively affects per capita income growth. Barro and Sala-i-Martin outline that government expenditure tends to negatively affect per capita income growth. in this study, government expenditure (GE-it) hypothesized to negatively affect per capita income. In the endogenous growth theory, it is stated that human capital is an important factor that positively affects per capita income growth. The educational attainment variable (edu_{i0}) is defined as the number of high schools and university students who are used as proxies for human capital. Means, human capital is hypothesized to be positive.

Data analysis used panel data regression analysis. Panel data regression is a regression technique that combines time series data with cross-sections. According to Agus (2017) method Panel data regression has several advantages compared to time series or cross-section data, namely being able to provide more data so it will produce a greater degree of freedom. Combining information from data time series and cross-section can overcome problems that arise when there is a problem with omitting variables (omitted-variables). The advantages of panel data regression include: (1) Panel data can explicitly account for individual heterogeneity by allowing for individual specific variables; (2) the ability to control this heterogeneity further makes panel data can be used to test and build more complex behavioral models; (3) panel data is based on repeated cross-sectional observations (time series), the panel data method is suitable for use as a study of dynamic adjustment; (4) a high number of observations has implications for data is more informative, more varied, and the collinearity between the data decreases, and the degree of freedom (df) is higher so more efficient estimation results can be obtained; (5) panel data can be used to study complex behavioral models; (6) panel data can be used to minimize bias that may be caused by the aggregation of individual data. With these advantages, the implication is that there is no need to test classical assumptions in the panel data model (Cabral & Castellanos-Sosa, 2019).

3. Results and Discussion

The analysis scenario is conducted to see the variables that have an influence (population, population growth, road length, human capital, exports, number of MSMEs/Small Entrepreneurs, and inflation in 2015–2018) on the dependent variable, namely, the average GRDP 2015 - 2019.

Based on the mentioned analysis of panel data is processed through SPSS was found that the obtained regression equation $Y = -1.147 - 0.021X_1 + 0.0946X_2 - 0.068X_3 - 0.105X_4 + 0.067X_5 + 0.151X_6 + 0.012X_7 + 0.011X_8$. The regression equation can be interpreted

more deeply, the value of the constant-coefficient (β_0) of -1.147 implies that if the value of the independent variable does not change or is constant, it can be predicted that the average GRDP in 2016 – 2019 will be in the range of -1.147 points.

The regression coefficient ($\beta_1X_1, \beta_2X_2, \dots, \beta_8X_8$) implies that: (1) the value of the GDP variable is the initial year -0.020, meaning that if the GDP base year has increased 1 point, the average GRDP in 2016–2019 will decrease by 0.020 points; (2) The value of the population variable is 0.0946. This is under the hypothesis, which states that population affects economic growth positively; (3) The value of the population growth variable is -0.068. Following the hypothesis, the growth of income per capita tends to be inversely proportional to population growth so that it is negative; (4) The variable value of asphalt/Pavel length is -0.105. The researcher's hypothesis about road length is related to accessibility. The better and easier it is to access a destination. It will reduce the cost of economic expenditure, so the variable length of the road should have a positive value; (5) The value of the human capital variable is 0.067. This agrees with the hypothesis that human capital is an important factor that positively influences per capita growth. We defined the variable educational attainment as the number of students enrolled in senior secondary and tertiary education relative to the provincial population because school attainment data were not available; (6) The value of the net export variable is 0.012. Following the hypothesis that exports are the second largest contributor to aggregate demand for the Indonesian economy (Indrawati, 2002) for exports are hypothesized to positively affect economic growth; (7) The variable value of the number of MSMEs/Small Entrepreneurs is 0.012. In line with the hypothesis that a higher the number of MSMEs/Small Entrepreneurs positively affects economic growth; and (8) The inflation variable value is 0.011. The inflation rate is considered to hamper economic growth and should have a negative value.

Furthermore, to determine whether the variable percentage of the 2015–2018 inflation rate, the length of asphalt/Pavel roads, the percentage of the number of students in the basic year, basic year GRDP, net exports, population growth, the number of MSMEs/small entrepreneurs and the total population together have a significant influence to the 2015 – 2019 average GRDP variable. A significance test was carried out using the F test formula as shown in the table below.

The F test results in the table above show F-calculated is 167,195 with a probability value (sig) of 0.000. The results of these calculations explain that the probability value of the F test is less than 0.05 and it is also proven by looking at $F\text{-calculated} > F\text{-table}$ ($167.195 > 2.04$) it can be concluded there is a significant influence between the inflation percentage variable for 2015–2018, the length of the asphalt road/Pavel, the percentage of the number of students in

the base year, a log of base year GRDP, net exports, population growth, the number of MSMEs/small entrepreneurs and the total population together to the 2015 – 2019 average GRDP.

To determine the effective contribution of the 2015–2019 inflation percentage variable 2018, the length of the asphalt/Pavel road, the percentage of the number of students in the base year, the base year GRDP log in the form of logs, net exports, population growth, the number of MSMEs/small entrepreneurs and the total population, first knowing the value of the correlation coefficient followed by the R test The test results can be seen in the table below.

From the results of the table above, it can be seen the value of R-arithmetic = 0.968 at $\alpha = 0.05$ at $N = 514$ and the value of the determinant coefficient or R-square (R^2) = 0.938 or 93.8%. The test results prove around 93.8% of the variation in the value of the 2016 – 2019 average GRDP variable is determined by the 2015–2018 inflation percentage variable, the length of asphalt/Pavel roads, the percentage of the number of students in the base year, the base year GRDP log, net exports, population growth.

The number of MSMEs/small entrepreneurs and the population while remaining 6.2% is influenced by other determinants. The factors influencing the development of per capita income from several researchers (Lessman & Seidel, 2017) reveal several factors related to convergence, including resources, mobility, trade openness, aid, federalism, and human resources. Nugraha and Prayitno (2020) revealed that road infrastructure increases convergence in eastern Indonesia. The results of this analysis prove that there is an effect of the percentage of 2015–2018 inflation, the length of asphalt/Pavel roads, the percentage of the number of students in the base year, the base year GRDP log, net exports, population growth, the number of MSMEs/small entrepreneurs and the total population on the average GRDP 2016 – 2019 in the strong categories interpretation.

A follow-up analysis looks at the disparity that occurs among regencies/cities, a convergence analysis is conducted by comparing the base year 2016 GRDP with the 2016–2019 average GRDP. The results of the graph of the processed data are as follows in Figure 1.

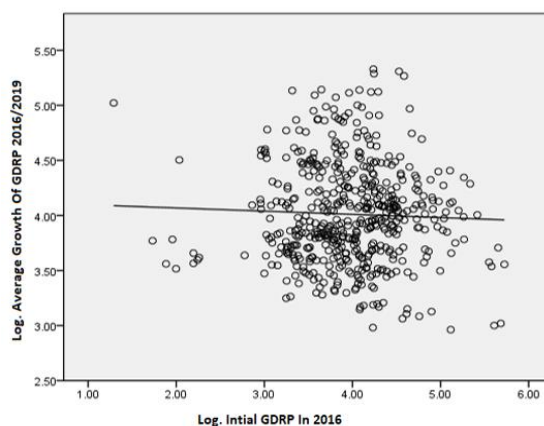


Figure 1. Convergence between Regencies/Cities in Indonesia in 2016 – 2019

The line in Figure 1 shows a declining trend in the value of the GRDP coefficient per capita. This decrease indicates that there is sigma convergence in regencies/cities in Indonesia. Sendouw (2018) found that convergence at the provincial level occurred in 1993–1997, but since 1997–2004 the opposite condition has occurred, namely, divergence. The results of the analysis depicted in the graph can be interpreted in general at Regency/City level in Indonesia, where there is convergence. This agrees with the results of research conducted by Lessmann and Seidel (2017), which states around 67%-70% of all countries experience sigma convergence. In the 1993–2005 period, (Aritenang & Sonn, 2018) found evidence of neoclassical convergence occurring in Indonesia, and decentralization was found to slow down this convergence. The sigma convergence occurring in regencies/cities indicates that the distribution of GRDP at the regency/municipal level in Indonesia is equalizing, so it can be interpreted that the disparity among regencies/cities in Indonesia is decreasing. Purba (2018) also found a similar decision that convergence is occurring in Indonesia.

4. Conclusion

This study is the first research to reveal the trend of convergence at the regencies and city levels in Indonesia. There has never been a study using neoclassical convergence to see the trend of convergence at the regencies and city levels in Indonesia.

Based on the results of the study, it can be concluded that the factors that significantly affect the disparity among Regencies/Cities in Indonesia are the percentage of 2015–2019 inflation, the length of asphalt/Pavel roads, the number of residents, net exports, population growth, the number of MSMEs/small entrepreneurs and the number of a resident. The results of the analysis using the neoclassical growth model theory or theory of convergence found at the regencies/cities level in Indonesia, the gap has decreased, which is indicated by the decreasing graph analysis results. As seen from the results of the analysis, the distribution of GRDP at the regencies/cities level in Indonesia is evenly distributed, it can reduce the disparity among regencies/cities but for a fairly long time.

The limitation of this study is that the data is relatively short because the data available are only from 2015 to 2019. The results will be more accurate if the data used are long.

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