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GROWTH, NETT ENROLLMENT RATIO AND CONVERGENCE OF HUMAN DEVELOPMENT INDEX

Joko Susanto[1)]
[1]Faculty of Economics and Business, Pembangunan Veteran Yogyakarta University
email: jk.susanto.68@gmail.com

ABSTRACT

This study analyses the convergence of Human Development Index (HDI) and contribution of growth and nett enrollment ratio in supporting this convergence based on a set panel data comprising 6 regency and 1 city in Former Surakarta Residency from 2007 to 2017. The data published by the Statistics of Jawa Tengah Province is used in this study. The results show that there is an convergence of Human Development Index (HDI) in Former Surakarta Residency. Therefore, Human Development Index in the lagging regions, tends to grow faster than advanced ones. The gap of Human Development Index among regions will disappear. The growth and nett enrollment ratio have positive impact in supporting convergence of Human Development Index. Better growth and nett enrollment ratio encourage lagging region tend to catch up with advanced ones.

Keywords: *Human Development Index, Growth, Nett Enrollment Ratio, Convergence*

JEL classification: *A1, J3*

1. INTRODUCTION

Notwithstanding the issue of poverty, another issue that regularly happens is the excessive inequality between territories. Hence, the government is accelerating advancement in distraught zones. By advancement speeding up, a few areas which have been left at the back of are capable of growing so that inequality will diminish. Neo-Classical hypothesis expresses that income disparity between areas will diminish alongside the progressing economic improvement. The growth of a poor area is quicker than the rich ones (Barro and Martin, 2004). The poor areas can get up to speed with per capita income of the rich ones so that there is an income convergence. This convergence process towards equilibrium leads to steady-state conditions assuming constant returns to scale. The differences in regional economic growth due to differences in production technology will shrink, and progressively these differences vanish as a result of free movement of capital and labor between regions.

Convergence dialogs are progressively attractive a result of the presence of many developing nations that are deteriorating, while a few nations are encountering high economic growth (Islam, 2003). Economic development that emphasizes macroeconomic growth tends to ignore the large gap between regions (Postoiu and Bușega, 2015). The income disparity emerges because of contrasts in ownership of resources. Resource is considered as one of the components supporting the process of economic growth. The assets accessibility in a given region makes it easier for acquiring and utilizing them. Conversely, a region where assets are not accessible, needs to rely upon other region in order to acquire it.

Initially, the discussion of convergence between regions included revenue convergence (Gyawali, Burkenya, Schelhas, & Fraser, 2008; Pedroni & Yao, 2006). In its development, the discussion of convergence also includes convergence in worker productivity (Cette, Corde, & Lecat, 2018; Udjianto, Susanto, & Purwiyanta, 2018) and convergence of the human development index (Erdal, Emre, & Kocbas, 2006; Singh & Sharma, 2017). The study of Pedroni and Yao (2006) in China shows that there is no income convergence between provinces. On the contrary, Gyawali's research et. al, (2008) indicates that the occurrence of income convergence in rural and sub urban areas and shows the existence of income convergence. Rural and sub urban areas that are relatively poor can grow faster than rich ones, so that they can catch up with income of the rich ones.

Furthermore, the results of research by Cette et al. (2012) show that the disparities in productivity between firms are smaller, indicating productivity convergence. The results of Udjianto et al. (2018) suggests that there is a process of convergence of labour productivity among districts in Gunungkidul Regency. The labour productivity, in the lagging districts, tends to grow faster than the advanced ones. Thus, the labor productivity gap between regions will disappear. Furthermore, the study by Erdal et al., (2006) suggest the existence of a significant converging trend among the countries concerning education levels and per capita income levels. While Singh and Sharma (2017) show that the low human development index (HDI) states growing faster than higher HDI states leading to convergence in terms of HDI.

One indicator of economic regional progress is the HDI value. The higher value of HDI, the higher welfare of community. Human Development Index (HDI) is formed by three basic dimensions, namely the dimensions of health, knowledge, and expenditure (decent living standards). The health dimension is measured through Life Expectancy at Birth, which is the number of years a newborn baby is expected to achieve. Meanwhile, the knowledge dimension is measured by indicators of Mean Year of Schooling. The dimensions of expenditure (decent living standards) are indicated by Average Expenditure per Capita. A government policy is needed to improve these three dimensions so that HDI value forever rise. The development of health and education sector will improve the level of public health and knowledge, whereas, economic growth will affect community welfare as indicated by an increase in expenditure per capita.

Disparities in Human Development Index (HDI) between regions occur as a result of the investment concentration in specific regions. Investors will try to get competitiveness areas, therefore, the investment tends to be concentrated in just a few places (Lall, Shalizi, & Deichman, 2004), especially, which are located close to markets or ports. Some companies will be located in cities with complete infrastructure. However, some regions that do not get new investment have difficulty for developing. For this reason, government policy is needed to realize an increase in income, especially for disadvantaged regions, such as the development of infrastructure and education.

Infrastructure development is an integral part of national development. Infrastructure is the driving force of economic growth. Infrastructure development, especially in the poor region, will have a multiplier impact on the local economy. The infrastructure improvement increases local economic capacity. Regions with greater economic capacity will be able to produce more copious amounts of output. The increase in goods and services provided by an economy shows economic growth. Economic growth is the process of increasing the production capacity of an economy which is realized in the form of an increase in national income. In the local scope, economic growth shows the development process that occurs in an area. The growth reflected in an increase of the real Gross Regional Domestic Product (GRDP). The real Gross Regional Domestic Product is the income that can be enjoyed by the community in an area. The increase in output (the number of goods and services) produced by an economy allows for an increase in consumption for citizens. Then, an increase in consumption is followed by an increase the social welfare.

Meanwhile, the development of the education sector will increase the availability of human capital. Human capital is related to the education level of community members living in an area. Human capital is a means for a country to win global competition. Investment in education has positive implications for adding resources to increase output. The ability to read and write is one of the essential elements of the early stages of the industrialization program. Furthermore, at a higher level of industrialization, higher technical skills are needed. Higher levels of education will increase one's knowledge so that they can work faster and more precisely. Higher levels of education are needed to support the sustainability of economic development. Higher knowledge supports the emergence of innovations in engineering, economics, and various other aspects of life. Knowledge and technology can produce innovations to promote economic growth. In general, the higher the education of community members, the higher the chances of working in the formal sector with higher income. Quality human resources are needed for the progress and success of a nation's development.

The level of education in an area can be identified, among others, from the value of the School Participation Rate. This value shows how many school-age residents have been able to utilize educational facilities according to their education level. The higher School Participation Rate, the higher the number of school-aged children can attend school on time. A better learning process will produce graduates who have higher skills. The higher level of one's education, the higher the level of productivity that can be achieved.

The high economic growth and the availability of skilled labor, make the disadvantaged regions can catch up (catch up) lagging with the developed ones (Barro & Martin, 2004). Thus inequality between regions, including inequality in the Human Development Index, will decrease. This reduction in inequality indicates a convergence process.

There are 2 (two) concepts of convergence, namely σ convergence and β convergence. The concept of σ convergence refers to the dispersion which can be measured by, for example, the standard deviation of the logarithm of income or product per capita between regions. If the value decrease, there will be income conditional convergence, and vice versa. Meanwhile, the concept of β convergence states that poor economies can catch up (catch up) a rich economy in terms of income per capita (Barro & Martin, 2004). The concept of β convergence can be divided into 2 (two), namely absolute convergence and conditional convergence. Absolute convergence refers to the measurement of convergence based on the initial income level only. Absolute convergence measurements are carried out without entering control variables which are the characteristics of each region. Each region is considered to have the same steady-state conditions so that in calculating convergence does not include other variables such as investment and population growth that differ between regions. The conditional convergence calculation is done by entering the influence of infrastructure and other variables (control variables) which are estimated to affect the steady-state conditions of each region. To see the effect of infrastructure and other variables that influence the steady state conditions of each region, we apply conditional convergence method.

The rapid development of regional economics has led to the growth and development of some regions in the Former Surakarta Residency. This change is followed by a change in the status and socio-economic level of the population and the development of economic activity. Even so, differences in ownership of endowment factors (including infrastructure) in each region have caused the growth of HDI between regions to vary. This condition is reflected in the disparity in the Human Development Index (HDI) between regency/cities in the Former Surakarta Residency area. HDI in Solo City is at a very high level with a value of 80.85. Meanwhile, Boyolali, Klaten, Sukoharjo, Karanganyar, and Sragen Regency have HDI at a high level with a score of 72.40 to 75.56. Wonogiri Regency is still at the level of medium HDI with a score of 68.66 (Table 1).

Table 1
Human Development Index (HDI) by Regency/ City, 2013-2017

HDI	2013	2014	2015	2016	2017
Boyolali	69.81	70.34	71.74	72.18	72.64
Klaten	72.42	73.19	73.81	73.97	74.25
Sukoharjo	73.22	73.76	74.53	75.06	75.56
Wonogiri	66.40	66.77	67.76	68.23	68.66
Karanganyar	73.33	73.89	74.26	74.90	75.22
Sragen	69.95	70.52	71.10	71.43	72.40
Solo	78.89	79.34	80.14	80.76	80.85

Source: Central Java BPS

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A disparity in HDI between regions is one of the shortcomings that disrupts the economic performance of the former Surakarta Residency. The government needs to encourage economic growth in regions that are left behind or have low HDI. This disadvantaged area is expected to be able to catch up with more developed regions. If this can be realized, IPM convergence will occur and at the same time decrease the HDI disparity between districts/cities.

2. RESEARCH METHOD

This study uses the Central Java Central Bureau of Statistics (BPS) publication. The research data will include the HDI value, economic growth and the Nett Enrollment Ratio for Senior High Schools and equivalent in the region / city in the Former Surakarta Residency. The scope of the study period is from 2007-2017. The selection of the final point in 2017 is due to the publication of BPS in that year as the latest publication. In line with the availability of BPS data, the scope of the research objects included Klaten, Sukoharjo, Karanganyar, Boyolali, Wonogiri, Sragen, and Solo City Regencies.

Hereafter, the operational variables are defined as follows. The Human Development Index is a measure of the ability of the population to access development outcomes that include health, education, and income in the region/city in the former Surakarta Residency. The economic growth is the growth of Gross Regional Domestic Product (GRDP) of regions/city in the former Surakarta Residency which is expressed in units of percent. Meanwhile, the Nett Enrollment Ratio is a comparison between the number of students in Senior High School and equivalent to the number of residents aged 16-18 years in Former Surakarta Residency and expressed in units of percent.

This study covers the condition of the Human Development Index by region/city in the Former Surakarta Residency area and the variables that influence it during the period 2007-2017. Thus the research data is in the form of panel data which is a combination of cross-sectional and time series data. Panel data has several advantages over cross-sectional data or time series data (Baltagi, 2005). Unlike the time series or cross-section data, in the panel data model, it is known individual effects indicated by the intercept. Individual effects differ for each crossover unit so that the regression model takes the form of a fixed effects or random effects model. For choosing a more appropriate model, the Hausman test will be done on the fixed effects or random effects model. The regression model will be estimated by SUR (*Seemingly Unrelated Regression*) method. The SUR Method is superior than Least Square Method because the error it produces is smaller. Furthermore, the research model is contained in the following dynamic model.

$$\Delta Y_{it} = \alpha_i + \omega Y_{i,t-1} + \sum_{j=0}^{k} \beta_{ij} X_{1it-j} + \sum_{j=1}^{k} \gamma_{ij} X_{2it-j} + e_{it}$$

Respectively, Y is the value of the Human Development Index (HDI), X_1 is economic growth and X_2 is the Nett Enrollment Ratio.

3. RESULTS AND DISCUSSION

3.1 Results

The cointegration test results show a Kao cointegration value of -3,563 with a probability of less than 0.05. This result suggests the cointegration between variables in the model. Thus in a set of variables in each model, there is a stationary linear combination. Residuals generated from the estimation of each model are stationary I (0). The variables in the model have a long-term balance relationship by economic theory. The estimated model has consistency in the long run, or at least there is a causality relationship in one direction between the variables in the model. Furthermore, based on the VAR estimation result, the minimum AIC value for the model occurs when the lag length is one year. Therefore, the VAR with length 1 is parsimonious VAR.

Furthermore, in the panel data regression, there are 2 (two) basic models, namely the fixed effects model and the random effects. The Hausman Test results show that the value is 7.896. This value is higher than the value of x^2 at 95% confidence level, so the chosen model is the fixed effects. It means that the results of the analysis are based on the fixed effects model. The estimation results show that the coefficient of determination (R^2) of 0.528 indicates that 52.8 percent of the variation in Human Development Index (HDI) can be explained by variations in the independent variables, whereas the remaining 47.2 percent is explained by other variables outside the model. Small coefficient of determination because the dependent variable is the first difference variable is not a variable at the level. Meanwhile, the significant value of F indicates that the independent variables jointly influence the dependent variable. Thus the model has excellent goodness of fit.

Table 2
Estimation Results (Fixed Effects)

No.	Variabel	Coefficient	Error Standard
1	HDI (previous year)	-0.187*	0.046
2	Growth	0.128*	0.032
3	Nett Enrollment Rate	0.032*	0.005
4	Constant	11.033*	3.258

Source: Central Java BPS

where:

Outcome: Change in HDI
Adjusted-R^2 = 0.528
F = 9,579*
* Significant at (α=5 per cent)

3.2 Discussion

The results show that the regression coefficient of HDI (previous year) is negative. It means that there is a process of convergence of HDI between the region in Former Surakarta Residency. The growth of HDI in the poor region is capable of pursuing HDI in rich one, and then the gap of HDI among regions will disappear. The coefficient of Human Development Index of the previous year of -0.187 indicates that if all other things being equal, an increase in HDI (previous year) by 1 causes a decrease of HDI (current) by 0.187 points. An increase in HDI in the lagging region is higher than that in the advanced region. Therefore, the lagging regions will be able to catch up from relatively advanced ones. An increase in HDI leads to a convergence of HDI. The results in line with Singh and Sharma (2017), in India, which state that the lower HDI states are growing faster than higher HDI states.

Furthermore, the economic growth variable has a positive regression coefficient on the human development index. The regression coefficient of economic growth of 0.128 shows that an increase in economic growth of 1 percent causes an increase in the human development index of 0.128 points (all other things being equal). Economic growth shows the addition of the amount of output produced by an economy. If economic growth is high enough, then per capita income will increase. An increase in per capita income will be followed by the rise in per capita expenditure which indicates an increase in decent living standards. It means an increase in the rate of economic growth will increase the human development index (HDI).

The rate of economic growth relies upon the number and nature of production factors including the quality of infrastructure. For instance, road infrastructure plays a significant role in encouraging the production process and at the time reducing production costs. Lower production costs must be accomplished if the production process takes place in a country or region with adequate infrastructure.

The company will choose a production location in a country or region with adequate infrastructure conditions so that the cost is most reduced. However, generally, the developing countries infrastructure conditions are a long way from sufficient. This condition causes the production process cannot happen easily. The non-smooth production process causes the length of the production process and brings down the efficiency.

Therefore, the government needs to focus on the accessibility of capital including infrastructure so that profitability can be expanded. With the higher rate of economic growth, the economies of regions that were once left behind could become quicker than the rich economy. The economy of underdeveloped regions can catch up with the developed regional economy.

Meanwhile, Nett Enrollment Rate have a positive effect on the human development index (HDI). The 0.032 pure enrollment coefficient indicates that an increase in high school enrollment rates equivalent to 1 percent will be followed by an increase in the human development index of 0.032 points (all other things considered constant). One important sector that has a direct link with the human development index (HDI) is the education sector. The level of education is directly related to the quality of human resources (HR). The main production factor in economic activity is labor or human. Quality workers cannot be obtained instantly. To obtain quality human resources requires a long process through serious and sustainable investment through education. The performance of the education sector is seen among others from the nett enrollment rate of the high school. The percentage of the number of workers with a high school education is of equal level. The qualifications of workers with equivalent high school education greatly determine the quality of human resources.

Improving the education sector will enhance social capital so that it can increase regional economic activity. The development of the education sector has a significant multiplier effects on the regional economy. The existence of educated and skilled workers in underdeveloped areas will encourage an increase of labor productivity so that the area can catch up with other regions. The existence of skilled labor will encourage the convergence of human development index between regions.

4. CONCLUSIONS

There is a process of convergence of income per capita in the Former Surakarta Residency area. An increase in the rate of economic growth and nett enrollment rate has an impact on increasing the human development index (HDI). The growth of the human development index (HDI) in underdeveloped regions can catch up from developed ones. The human development index (HDI) gap between regions/cities will be lost. Thus the increase in the rate of economic growth and net enrollment rate will support the convergence of the human development index (HDI) in the Former Surakarta Residency.

Local governments need to develop some sectors that encourage economic growth and community participation in the field of education. Consequently, it is important to develop physical infrastructure, especially roads. The multiplier effect of road infrastructure development is substantial. Construction of highway infrastructure improves connectivity between regions so that farmers and small business economic players market their products. The existence of highway facilities especially in underdeveloped areas will be able to encourage economic growth so that underdeveloped regions can pursue income in developed regions. Thus the income gap between sub-districts will be lost. Also, local governments need to improve various educational facilities and systems to form excellent human resources. Investment in human resources is the central pillar that significantly determines the success of the development.

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