



Aceh Province Economic Convergence Determination

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Abstract

This study analyzes the occurrence of economic convergence between districts / cities in Aceh Province and looks at the factors that can accelerate the economic convergence. This study uses panel data from 23 districts / cities in Aceh Province for the period 2008-2018. The results found from this study are that there has been economic convergence, both sigma convergence and beta convergence, in Aceh Province. Factors that significantly influence economic convergence in Aceh Province are the average length of schooling, life expectancy, and the special autonomy fund. The time needed to get to half the convergence process is 4.10 years with the resulting conditional beta convergence rate of 16.89%.

Keywords: economic convergence, economic development, Aceh Province

1. Introduction

Basically, economic development is an effort to manage existing resources optimally with the aim of community welfare. One of the empirical indicators to see an increase in welfare is an increase in per capita income and a reduction in the income distribution gap (Zulham et al., 2015). Many policies have been produced by the government to obtain high economic growth but also produce welfare that is evenly distributed between regions. One of the policies that have been produced by the government is implementing decentralization in 2001. This decentralization policy allows the central government to focus on macro policies only, while local governments can optimize the potential for economic development in the regions.

One province in Indonesia that has also felt the policy of decentralization is Aceh Province. In Figure 1 it can be seen that after the implementation of the decentralization policy, the economic growth rate of Aceh Province increased by 20.07 percent compared to the previous year. However, in 2004, Aceh Province experienced an earthquake and tsunami which had a major impact on the economy in Aceh Province. This can be seen from the negative growth rate for 2 (two) consecutive years, namely in 2004 (-9.63%) and 2005 (-10.12%). After going through this difficult period, the economy of Aceh Province has slowly begun to improve, especially after the provision of the special autonomy fund (DOK) in 2008.

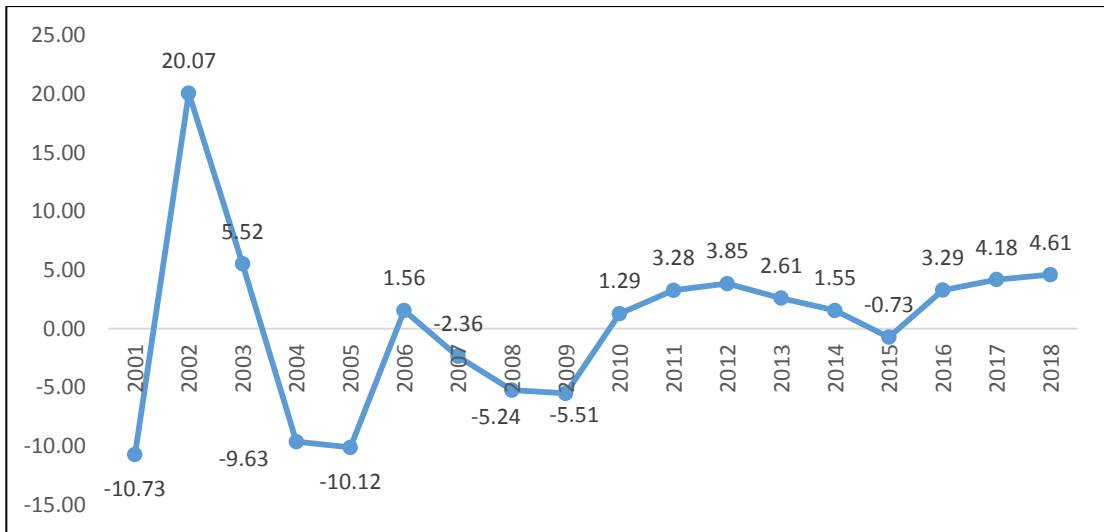


Figure 1. Economic Growth Rate of Aceh Province 2001 - 2018 (Percent)
Source: Statistics of Aceh Province

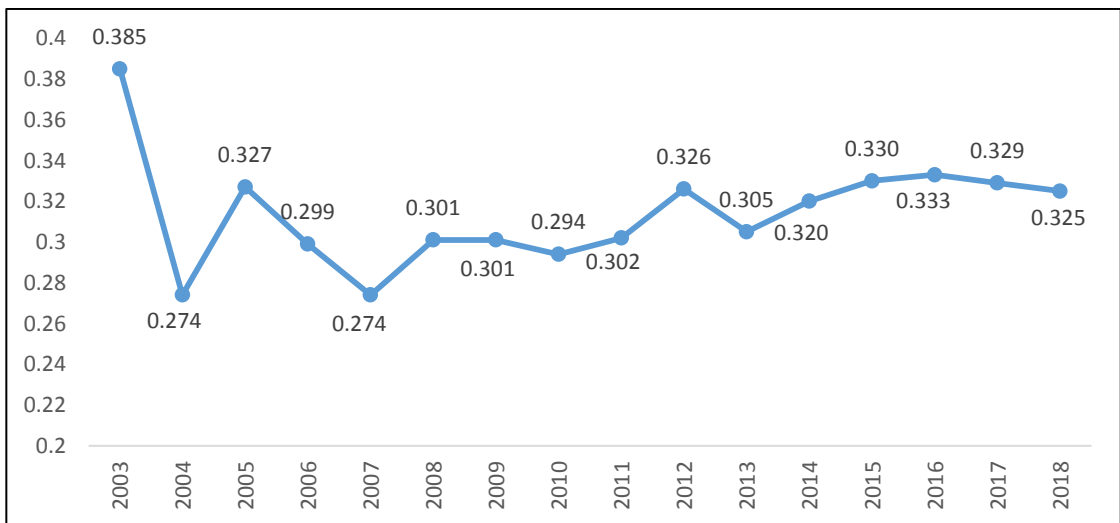


Figure 2. Gini Ratio of Aceh Province 2003 - 2018
Source: Statistics of Aceh Province

Apart from fluctuating economic growth, the economy of Aceh Province is also faced with complex welfare problems. This can be seen from Figure 2 where the Gini ratio tended to increase in the 2003-2018 period, which illustrates that the level of welfare of the people of Aceh Province tends to be increasingly unbalanced. And what is ironic is that the increase in the Gini ratio is the largest after the provision of DOK, even though the aim of giving DOK is for the stability of the Aceh Province economy and to improve the welfare of the Acehese people so that in the long run it will produce an even level of welfare in Aceh Province. This is consistent with the hypothesis put forward by Kuznets (1971) that at the beginning of growth, the income gap is higher.

Therefore, the researcher feels it is necessary to conduct a study regarding the factors that influence economic convergence in Aceh Province. The purpose of this research is to identify the occurrence of economic convergence between regency/city in Aceh Province and to find out what variables drive economic growth to accelerate the economic convergence between regency/city in Aceh Province for the period 2008-2018.

2. Literature Review

The problem of differences faced between communities or between regions is a problem resulting from income inequality. The greater the income gap between communities or between regions, the greater the variation in income distribution which will lead to income disparities. This is inseparable from the trickle-down effect or the downward absorption effect of the output (Kharabsheh, 2001).

Inequality is one of the problems that developing countries must face in addition to economic growth and poverty. The difference in the content of natural resources and the geographic conditions of each region is a factor in the difference in the ability of a region to encourage economic growth to create income inequality between regions.

Meanwhile, economic convergence is a condition in which the economy of poor regions tends to grow faster than the economies of rich regions. It is hoped that the economy of the poor regions can catch up with the disadvantages of the rich regions so that in a certain period it can achieve equal distribution of income between regions.

The Solow-Swan theory is one of the theories explaining convergence. This convergence can be seen based on the depletion of capital described by the Neo-Classical theory. According to Barro & Sala-i-Martin (1995), through the theory of economic convergence, the difference between economic levels between regions can be reduced due to reduced returns on capital over time (diminishing return on capital). The main concept of convergence according to Barro & Sala-i-Martin (2004) is divided into 2 sizes, namely:

1. Sigma Convergence

This sigma convergence will occur if an economy decreases inequality of per capita income between the analyzed regions. This is by the Neo-Classical theory which states that every economy in a period will be evenly distributed or there will be convergence at the same level.

2. Beta Convergence

This beta convergence states that regions with underdeveloped economies will tend to grow faster than regions with relatively developed economies. In practice, there are 2 (two) types of beta convergence, namely absolute beta convergence and conditional beta convergence. Absolute beta convergence only looks at the initial physical capital without considering other factors such as differences in economic structure between regions and regional characteristics. Meanwhile, conditional beta convergence, apart from looking at the initial physical capital, also pays attention to differences in the economic structure and welfare or income levels of each region, which do not converge at the same level, but the differences between these regions are stationary so that in a certain period the rate of economic growth and income distribution will be evenly distributed between regions.

The variables to be examined in this study are special autonomy funds, life expectancy, the average length of schooling, and the percentage of poor people. To make it easier to understand the framework, the conceptual framework is described in the Figure 3.

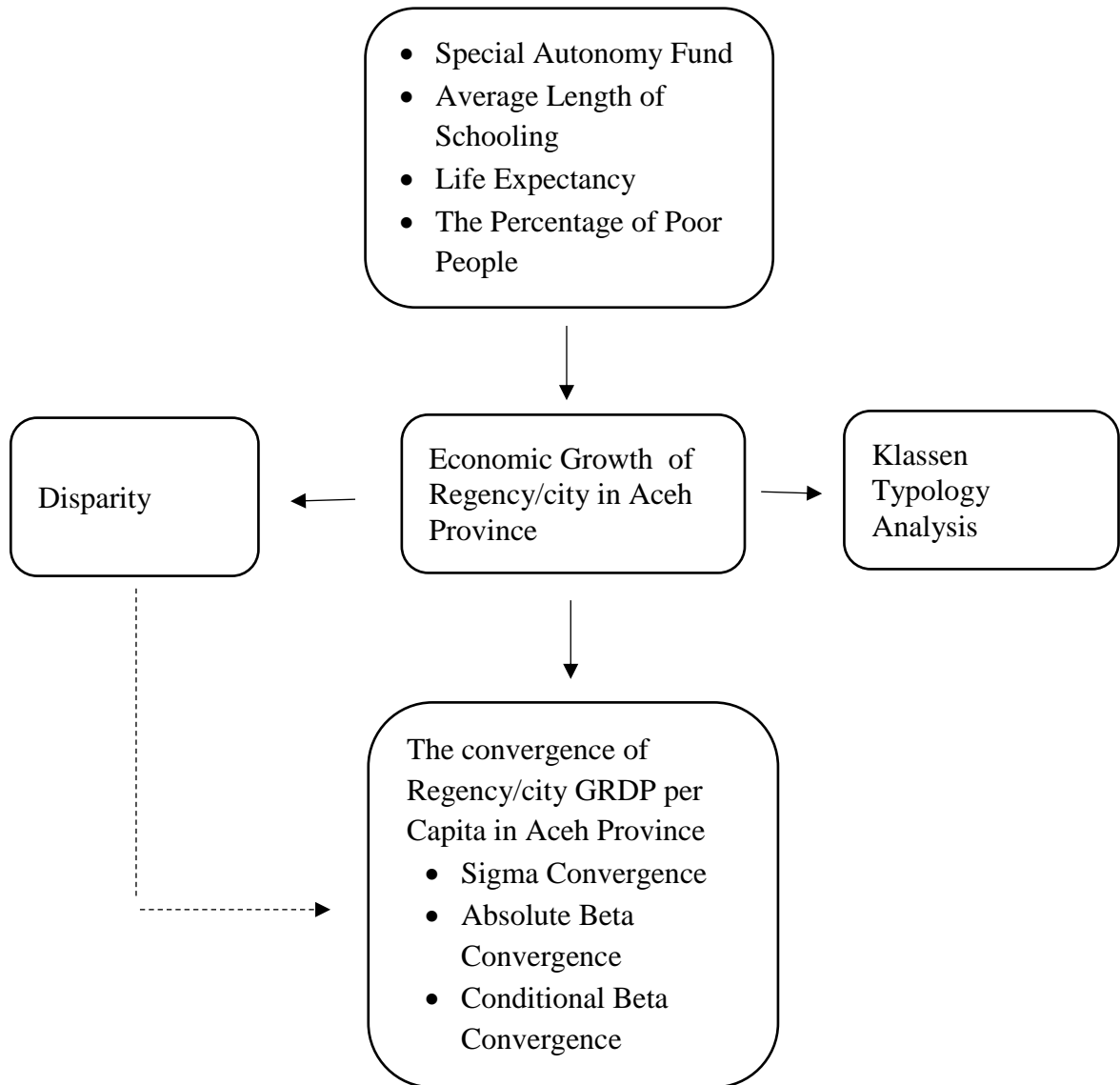


Figure 3. Conceptual Framework

Zulham et al. (2019) in his study of the supply chain strategy for convergence of economic growth in the East Coast region in North Sumatra Province, stated that there is a convergence process of economic growth that occurs between regency/city in the East Coast region, North Sumatra Province. The convergence speed that occurred was 23.40%. The Conditional Beta Convergence Model has a higher speed than the Absolute Beta Convergence Model. This is due to the significant influence provided by the independent variables, namely Gross Regional Domestic Product per Capita, working population, number of poor people, and length of study in increasing the convergence speed of economic growth in the East Coast region of North Sumatra, Indonesia. Meanwhile, Vidyattama (2013) in his research on the analysis of convergence of economic growth in Indonesia in 1992-2012 found that there was no Absolute Beta Convergence and Conditional Beta Convergence. This illustrates that poor regions have slower growth than richer regions.

Aulia (2017) and Kamil (2014) in their research on the convergence analysis of economic growth in ASEAN countries where the results of the two studies show that there has been a decrease in the per capita income dispersion over time. Furthermore, the beta convergence analysis shows that there has been a convergence of beta absolute and conditional in ASEAN countries. This indicates that countries with low economies have higher economic growth than countries with developed economies.

Apart from the ASEAN region, there are also many studies related to convergence carried out outside the ASEAN region. The results obtained are that there is a convergence between 15 European Union countries except for the period 1980 - 1985 where there has been economic divergence even though it is weak (Yin et al., 2015). Research with the same scope of research but different influencing factors was also carried out by Goecke and Huther (2016), it was found that the relative size of the industrial sector represented by the percentage of industrial employment has a positive correlation with the convergence process, even after controlling for countries in Eastern Europe. However, increasing the size of the industrial sector cannot have a very large effect depending on the extent to which the composition of the economy (in terms of the relative size of the manufacturing and service sectors) can determine its success based on the economic history or the region involved. Payment from EU regional funds also has a positive correlation with the trend towards convergence.

In line with the research conducted by Goecke and Huther (2018) concluded that there had been economic convergence in the Slovakian and Czech Republic regions. Dogan and Kindap (2019) conducted research related to convergence in Turkey for the period 2004-2011, showing that the income gap between regions decreased during periods of economic recession and increased during periods of economic expansion. The results of beta convergence are also obtained by cross-sectional estimation and the panel shows the existence of Absolute Beta Convergence. This is supported by research conducted by Gömleksiz (2017), it was found that based on the sigma convergence, it was found that there was a tendency for economic convergence in the Turkish region. Meanwhile, based on beta convergence, the researcher reaches the result that the real GDP per capita parameter has a significant negative sign in the unconditional model. Therefore, it can be argued that there is clear evidence for the presence of unconditional β convergence throughout Turkey between 2004 and 2014.

3. Methodology

The data structure used is panel data, namely a cross-section of 23 regency/city in Aceh Province and time series for the period 2008-2018. The variables used in this study are the Gross Regional Domestic Product (GRDP) at constant 2010 prices, special autonomy funds, the average length of schooling, life expectancy, and the percentage of poor people. The data used in this study is secondary data obtained from the Central Statistics Agency (BPS).

The analysis used is the analysis of typology class and convergence analysis. Classification typology analysis is used to provide an overview of the pattern and structure of regional economic growth and to describe the classification gap between regions. According to Aswandi and Kuncoro (2002), Klassen typology can be divided into 4 (four) classifications, each of which has different characteristics. Meanwhile, there are several measures of convergence analysis that can describe the convergence process, namely sigma convergence (σ convergence) and beta convergence (β convergence) where beta convergence is divided into absolute and conditional.

The model used to identify the occurrence of Absolute Beta Convergence following the regression model described by Barro and Sala-i-Martin (1992) is:

$$\text{Log}\left(\frac{y_{it}}{y_{i(t-1)}}\right) = \alpha + (1 - e^{-\beta})\log(y_{i(t-1)}) + u_{it} \quad (1)$$

$$\text{Log}\left(\frac{y_{it}}{y_{i(t-1)}}\right) = \alpha + \theta \log(y_{i(t-1)}) + u_{it} \quad (2)$$

It is assumed that $y_{it}/y_{i(t-1)} = \text{PE}_{it}$, then :

$$\text{Log}(\text{PE}_{it}) = \alpha + \theta \log(y_{i(t-1)}) + u_{it} \quad (3)$$

where:

- α : Intercept
- θ : Slope
- y_{it} : The level of income per capita of the region-i year t
- $y_{i(t-1)}$: The level of income per capita of the region-i year t-1
- PE_{it} : The economic growth of the region-i year t
- u_{it} : residuals that follow a normal distribution
- i : Regency/city in Aceh Province
- t : 2008, 2009, ..., 2018

In the Absolute Beta Convergence Model, the value of the slope (θ) in the variable level of income per capita in region i year $t-1$ ($y_{i(t-1)}$) can explain whether or not convergence occurs. The slope with a negative sign or between the level of per capita income in the previous period and the rate of economic growth has a negative relationship indicating that Absolute Beta Convergence has occurred. A slope with a positive sign indicates that the region's economy is not converging, even leading to divergence (inequality).

Furthermore, the conditional beta convergence model in principle uses the same model in the absolute beta convergence model plus the control variables. The formula used is:

$$\text{Log}(\text{PE}_{it}) = \alpha + (1 - e^{-\beta})\log(y_{i(t-1)}) + \gamma X_{it} + u_{it} \quad (4)$$

$$\text{Log}(\text{PE}_{it}) = \alpha + \theta \log(y_{i(t-1)}) + \gamma X_{it} + u_{it} \quad (5)$$

where:

- α : Intercept
- θ : Slope
- PE_{it} : The economic growth of the region i year t
- $y_{i(t-1)}$: The level of income per capita of the region-i year t-1
- u_{it} : residuals that follow a normal distribution
- X_{it} : vector of control variables in region i year t
- i : Regency/city in Aceh Province
- t : 2008, 2009, ..., 2018

Just like the Absolute Beta Convergence Model, Conditional Beta Convergence can also be measured by looking at the parameter value θ . the value of the parameter " θ " must be significantly negative, indicating that the region's economy has undergone a convergence process.

Furthermore, to calculate the convergence rate that occurs, the estimation results generated by the parameter θ can be used.

In achieving half-life time or the time it takes a region to reach the middle of the variation, the following formula can be used:

$$\tau = \frac{-\ln(0,5)}{\varphi} \text{ or } \tau = \frac{\ln(2)}{\varphi} \quad (6)$$

The initial model used to see economic convergence is Absolute Beta Convergence which only uses the per capita GRDP variable in the initial year of the study as the independent variable. The Absolute Beta Convergence model used is:

$$\text{LN}(\text{PE}_{it}) = \alpha_i + \beta_1 \text{LN}(Y_{i(t-1)}) + \varepsilon_{it} \quad (7)$$

where:

- α : Intercept
- θ : Slope
- PE_{it} : The economic growth of the region i year t
- $Y_{i(t-1)}$: The level of income per capita of the region- i year $t-1$
- ε_{it} : residuals that follow a normal distribution
- i : Regency/city in Aceh Province
- t : 2008, 2009, ..., 2018

After obtaining the best model for Absolute Beta Convergence, then a specification of Conditional Beta Convergence is carried out by including variables that are expected to influence economic convergence. The indication of achieving economic convergence at Conditional Beta Convergence is the same as Absolute Beta Convergence. The models used in Conditional Beta Convergence are:

$$\begin{aligned} \text{LN}(\text{PE}_{it}) = & \alpha_i + \beta_1 \text{LN}(Y_{i(t-1)}) + \beta_2 \text{LN}(\text{PM}_{it}) + \beta_3 \text{LN}(\text{RLS}_{it}) + \beta_4 \text{LN}(\text{UHH}_{it}) \\ & + \beta_5 \text{LN}(\text{DOK}_{it}) + \varepsilon_{it} \end{aligned} \quad (8)$$

where:

- α : Intercept
- θ : Slope
- PE_{it} : The economic growth of the region i year t
- $Y_{i(t-1)}$: The level of income per capita of the region- i year $t-1$
- PM_{it} : The Percentage of Poor People of the region i year t
- RLS_{it} : Average Length of Schooling of the region i year t
- UHH_{it} : Life Expectancy of the region i year t
- DOK_{it} : Amount of the Special Autonomy Fund of the region i year t
- ε_{it} : residuals that follow a normal distribution
- i : Regency/city in Aceh Province
- t : 2008, 2009, ..., 2018

4. Results and Discussion

4.1 Klassen Typology Analysis

In order to develop regions, the government must determine policy priorities. In determining these priorities, a comprehensive economic analysis (economic structure) is required so that regional development can be more focused and run more effectively and efficiently. The analysis that can be used to see the structure and economic growth is Klassen Typology, namely by grouping Regency/city in Aceh Province based on two main indicators, namely economic growth and per capita income so that these areas can be divided into four groups/classifications, namely: (1) Quadrant I: Developed and fast-growing areas; (2) Quadrant II: Developed but depressed areas; (3) Quadrant III: The area is rapidly developing; and (4) Quadrant IV: Relatively disadvantaged areas.

Based on Figures 4 and 5 illustrate the development of the regions in Aceh Province from 2008 to 2018 in terms of economic growth rate and per capita income. In general, it is known that the regions in Aceh Province are classified as relatively developed and underdeveloped areas. This indicates that there are still many areas in Aceh Province that need more attention to improve their economy in the hope that these regions will be able to catch up with developed regions.

Although in general, the regions in Aceh Province are relatively developed and underdeveloped, there are several regions that have developed economies. Banda Aceh city as the capital of Aceh Province appears to have the best economy in terms of per capita income and economic growth. This is very reasonable because Banda Aceh is the economic center of Aceh Province. Also, the region with a high economy is Lhokseumawe City which even recorded the highest per capita income in Aceh Province in 2008. Although Lhokseumawe City has a high per capita income, this region is classified as a region with a developed but depressed economy. This cannot be separated from the region's dependence on the mining sector alone. Even though they have developed economies, regions that rely on one sector only will be depressed because of the slowing rate of economic growth.

Besides, it is also known that several regions have good economic development. Among them are Aceh Barat Regency, Aceh Utara Regency, and Sabang City. The achievements of these areas cannot be separated from good economic development, namely the shift in the leading sectors of these regions from the agricultural sector to the industrial sector.

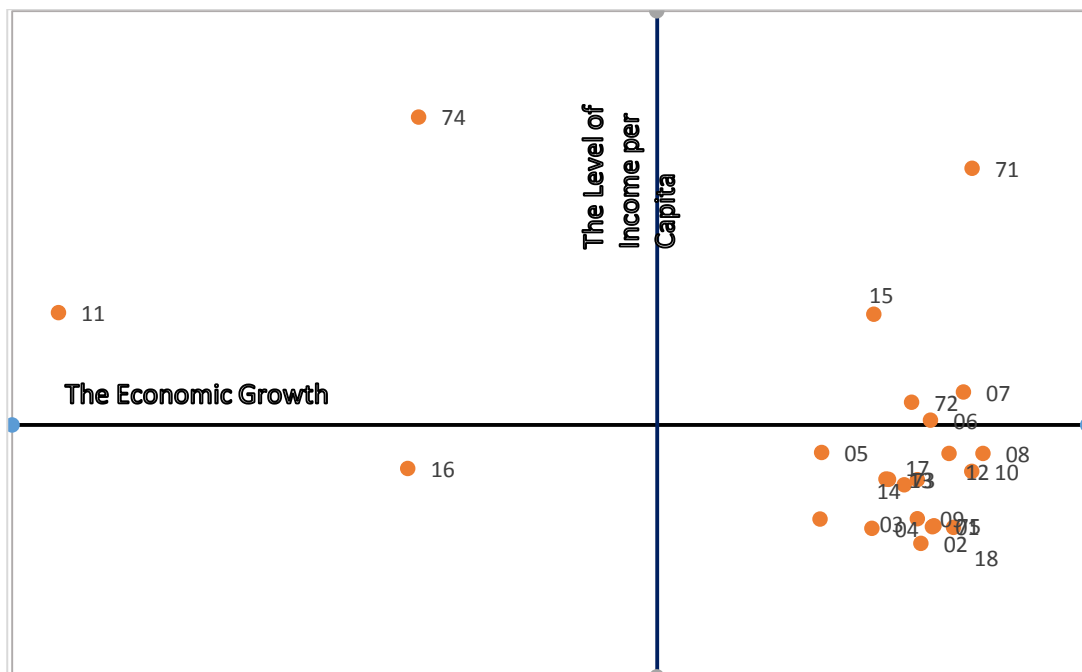


Figure 4. Classification of Regency/city at Aceh Province in 2008 based on Klassen Typology

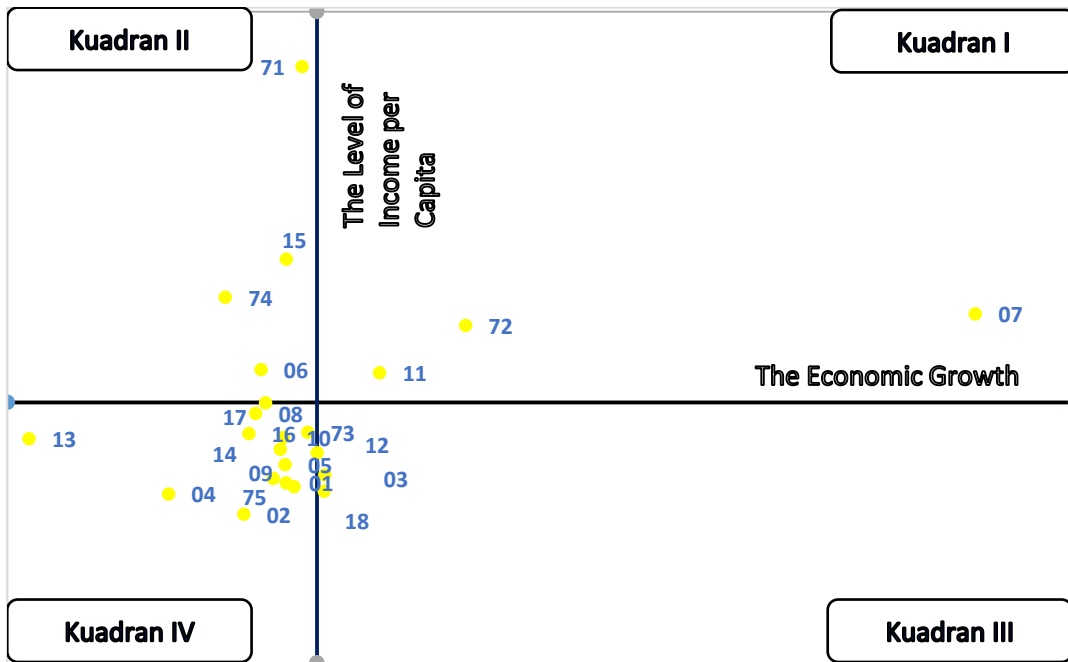


Figure 5. Classification of Regency/city at Aceh Province in 2018 based on Klassen Typology

Note :

- | | | |
|------------------|---------------------|------------------|
| 1. Simeulue | 9. Pidie | 17. Bener Meriah |
| 2. Aceh Singkil | 10. Bireuen | 18. Pidie Jaya |
| 3. Aceh Selatan | 11. Aceh Utara | 71. Banda Aceh |
| 4. Aceh Tenggara | 12. Aceh Barat Daya | 72. Sabang |
| 5. Aceh Timur | 13. Gayo Lues | 73. Langsa |
| 6. Aceh Tengah | 14. Aceh Tamiang | 74. Lhoksumawe |
| 7. Aceh Barat | 15. Nagan Raya | 75. Subulussalam |
| 8. Aceh Besar | 16. Aceh Jaya | |

4.2 Convergence Analysis

As previously discussed, in convergence analysis there are two types of convergence, namely sigma convergence and beta convergence. Sigma convergence and beta convergence are not identical but empirically, beta convergence will be verified when the sigma convergence is verified. Based on this empirical theory, this research will begin with analyzing the sigma convergence.

4.2.1 Sigma Convergence

Based on the results of the calculation of the level of dispersion of the per capita GRDP between Regency / city in Aceh Province in 2008-2018, it appears that it tends to decline. Based on Figure 6, it can be seen that from 2008 to 2010 there was a decrease in the coefficient of variation in PDRB per capita between Regency / city in Aceh Province. Although it increased in 2016, the coefficient of variation continued to decline in the following year. The decline in the value of the coefficient of variation in GRDP per capita indicates that there has been a decrease in the level of inequality between

Regency / city in Aceh Province. This decrease in the level of inequality also shows that there has been a sigma convergence in Aceh Province. The following is a graph of the coefficient of variation (CV) of per capita GRDP between Regency / city in Aceh Province in 2008-2018.

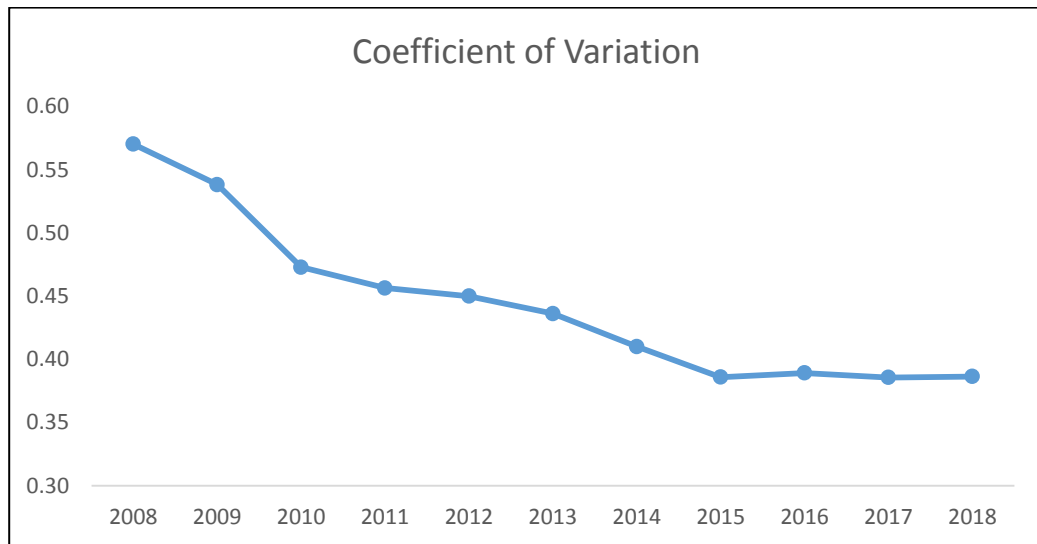


Figure 6. The Coefficient of Variation in GRDP per Capita between Regency/city in Aceh Province, 2008-2018

4.2.2 Beta Convergence

After the indication of the occurrence of sigma convergence, then a beta convergence analysis will be carried out.

a) Absolute Beta Convergence

In analyzing absolute beta convergence, several panel data estimation models were selected, namely common effects, fixed effects, and random effects. After selecting the best regression model, the random effects model is estimated to have fulfilled the classical assumption test. The results of panel data regression estimates for absolute beta convergence using the randomeffects model approach are presented in Table 1.

Furthermore, the absolute beta convergence equation can be presented as follows:

$$\text{LN}(\text{PE}_{it}) = 0.3099 - 0.0986 \text{LN}(\text{PDRB}_{(t-1)}) \quad (9)$$

The negative coefficient of per capita income indicates that there has been an absolute beta convergence in the per capita GRDP between Regency/city in Aceh Province during the study period. This means that more underdeveloped areas have an absolute tendency to grow faster than more developed regions so that income inequality between regions in Aceh Province will decrease.

Table 1. The Estimation Results of Panel Data Regression for Absolute Beta Convergence with the Random Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.309941	0.064309	4.819533	0.0000
LN(PDRB _(t-1))	-0.098630	0.021356	-4.618313	0.0000
Summary Statistics				
R-squared	0.418421	F-statistic	7.163283	
Adjusted R-squared	0.360009	Prob(F-statistic)	0.000000	

As for knowing how fast the convergence rate occurs at absolute beta convergence (φ) and how long it takes to reach the half-life time convergence condition, it can be obtained by calculating:

The convergence rate (φ) that occurs is:

$$\begin{aligned}\varphi &= \ln(1 + 0.0986) \\ \varphi &= 0.0940\end{aligned}\quad (10)$$

The half-life time is:

$$\begin{aligned}\tau &= \frac{-\ln(0.5)}{0.0940} \text{ or } \tau = \frac{\ln(2)}{0.0940} \\ \tau &= 7.3739\end{aligned}\quad (11)$$

It can be concluded that the convergence rate (φ) that occurs between regions in Aceh Province based on the absolute beta convergence is 9.40 percent. Based on this rate, the time needed for Aceh Province to reach half the convergence time is 7.3739 years. These results indicate that there is absolute convergence with a fast convergence rate which means that the time to reach half of the convergence does not take too long.

b) Conditional Beta Convergence

After analyzing the absolute beta convergence, an analysis of the conditional beta convergence will be carried out. This analysis aims to see whether incorporating other explanatory variables into the model will trigger faster economic convergence in Aceh Province. As for the conditional beta convergence model, the previous year's per capita income variable for each research area will be included as well as several other explanatory variables that are expected to accelerate the convergence rate in Aceh province. The explanatory variables are the average length of schooling, The Percentage of Poor People, life expectancy, and the special autonomy fund.

In analyzing conditional beta convergence, it is the same as analyzing absolute beta convergence. Estimation of the conditional convergence model is done by selecting several panel data estimation models, namely the common effects model, the fixed effects model, and the random effects model.

The best model chosen is the fixed effect model. Next, the results of the estimation of the conditional beta convergence model with the fixed effects model approach are presented in Table 2.

Table 2. The Estimation Results of Panel Data Regression for Conditional Beta Convergence with The Fixed Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.843118	1.678285	-2.289908	0.0230
LN(PDRB)	-0.184040	0.049341	-3.729985	0.0002
LN(PM)	0.028648	0.018369	1.559534	0.1203
LN(RLS)	0.077067	0.039917	1.930680	0.0548
LN(UHH)	0.741610	0.393335	1.885444	0.0607
LN(DOK)	0.040778	0.011106	3.671602	0.0003
Summary Statistics				
R-squared	0.397112	F-statistic	5.489013	
Adjusted R-squared	0.324765	Prob(F-statistic)	0.000000	

Statistically, the estimates of the resulting conditional beta convergence are fit. This can be seen based on the value of Prob (F-statistic) of 0.000000 which is smaller than the test level of 5 percent. This situation indicates that there is at least one variable that significantly affects the occurrence of economic convergence.

Furthermore, the conditional beta convergence model can be formulated as follows:

$$\begin{aligned} \text{LN}(\text{PE}_{it}) = & (-3.843118) - 0.184040 \text{LN}(\text{PDRB}_{i(t-1)})^* + 0.028648 \text{LN}(\text{PM}_{it}) \\ & + 0.077067 \text{LN}(\text{RLS}_{it})^{**} + 0.741610 \text{LN}(\text{UHH}_{it})^{**} \\ & + 0.040778 \text{LN}(\text{DOK}_{it})^* \end{aligned} \quad (12)$$

* Significant at the 5 percent test level

** Significant at the 10 percent test level

Similar to the absolute beta convergence, to see the conditional beta convergence it can be seen from the negative per capita income of the previous year. This shows that there has been conditional beta convergence during the study period, which means that the per capita income between Regency / city in Aceh Province tends to be even (convergent). This indicates that poor areas grow faster than richer regions.

The condition of conditional beta convergence in Aceh Province has a convergence rate (φ) and the time required for Aceh Province to achieve convergence (half-life time) as follows:

The convergence rate (φ) that occurs is:

$$\begin{aligned} \varphi &= \ln(1 + 0.1840) \\ \varphi &= 0.1689 \end{aligned} \quad (13)$$

The half-life time is:

$$\begin{aligned} \tau &= \frac{-\ln(0.5)}{0.1689} \text{ or } \tau = \frac{\ln(2)}{0.1689} \\ \tau &= 4.1039 \end{aligned} \quad (14)$$

Based on the φ value and the half-life time obtained, it describes the high rate of beta convergence after adding several other explanatory variables, namely 16.89 percent. The high rate of conditional beta convergence has resulted in an accelerated process of half of the economic convergence between Regency / city in Aceh Province, namely for 4.1039 years.

The results obtained indicate that the convergence rate of conditional beta convergence is faster than the convergence rate of absolute beta convergence. Therefore, the time needed to achieve half convergence at conditional beta convergence is faster than that of absolute beta convergence. This shows the importance of the role of the explanatory variables which are thought to be able to accelerate the process of convergence between Regency/city in Aceh Province. Based on the estimation of conditional beta convergence, it is known that almost all variables have a positive effect on economic growth to accelerate the process of economic convergence, namely the average length of schooling, life expectancy, and special autonomy funds. Meanwhile, the variable percentage of poor people has no significant effect in this study.

The percentage variable of poor people that can describe the role of poverty on economic growth where the results obtained do not have a significant effect and have a positive coefficient. This is certainly surprising because it contradicts the theory that poverty alleviation will boost the economy. This is due to the high percentage of poor people in Aceh Province which is caused by large economic inequalities which make the economy unable to be felt by people who are classified as poor. This can be seen from the still high percentage of poor people in Aceh Province in 2018 as much as 15.68 percent. This value is much higher than the percentage of poor people in Indonesia, which is 9.8 percent (Central Bureau of Statistics of the Republic of Indonesia, 2019). Besides, Aceh Province has the third-largest APBD compared to 34 other provinces in Indonesia but still has a relatively higher percentage of poverty compared to the national level (Abd Majid, 2014).

Then the variable average length of school that represents the quality of education also has a positive influence on economic growth with an effect of 0.077067, which means that every 1-year increase in the average length of schooling will increase economic growth by 0.077067 percent. The higher the level of education of the people of Aceh Province, the higher the human capital possessed by economic actors in Aceh Province which has an impact on increasing productivity per worker in Aceh Province. This increased productivity has led to increased economic growth in Aceh Province.

The last variable is the percentage of poor people that can represent the role of the government in implementing budget policies related to support for the regional economy. The positive regression coefficient of the special autonomy fund variable is 0.040778, which means that every 1 percent increase in regional spending will increase by 0.040778 percent of economic growth. This shows that the role of the Aceh Province special autonomy fund in the regional economy is very good, especially in terms of expenditure, both in terms of expenditures that are program, project, and routine in nature.

Furthermore, the life expectancy variable also has a positive relationship with economic growth. The coefficient generated from the regression model is 0.741610, which means that every 1 percent increase in life expectancy will increase economic growth by 0.741610 percent. In line with the variable average length of schooling, the increase in the human capital factor can increase productivity per worker to increase economic growth.

5. Conclusion

Based on the results and discussion previously discussed, the conclusions given in this study are as follows:

1. Economic development in Aceh Province from 2008 to 2018 is very good in terms of the increasing trend in economic growth.
2. There has been economic convergence, both sigma convergence and beta convergence between regency/city in Aceh Province from 2008 to 2018.
 - a. The sigma convention test has seen from the dispersion pattern of the real GDP per capita standard deviation value for the period 2008-2018 resulted in a decreasing trend. These results indicate that there has been a sigma convergence, which means that income inequality between regency/city in Aceh Province tends to decline.

- b. Testing of absolute beta convergence between regency/city in Aceh Province during the 2008-2018 period also shows economic convergence, which means that there is a tendency for regions with relatively underdeveloped economies to catch up compared to developed regions.
 - c. Testing of conditional beta convergence between regency/city in Aceh Province during the 2008-2018 period which took into account differences in natural, social, and demographic characteristics also showed that there was economic convergence between regency/city in Aceh Province.
3. All variables except the variable percentage of poor people used in this study have a significant positive effect on economic growth in accelerating the process of economic convergence. Among these variables are the average length of schooling, life expectancy, and the special autonomy fund. Meanwhile, the variable percentage of poor people has no significant effect.

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