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**The Impact of the Special Autonomy Fund on the Convergence
of the Human Development Index in Aceh**

Irwan Safwadi

Abulyatama University, Indonesia

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THE IMPACT OF THE SPECIAL AUTONOMY FUND ON THE CONVERGENCE OF THE HUMAN DEVELOPMENT INDEX IN ACEH

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Abstract

Since 2008, district/city governments in Aceh have received special autonomy funds transfers from the central government. This study aimed to assess the absolute and conditional convergence of HDI in Aceh, and examine the effect of special autonomy funds and other socio-economic variables on HDI conditional convergence during the implementation of special autonomy in Aceh. The data used were secondary data with panel data covering 23 districts/cities in Aceh in 2008-2017. The analysis model used was the convergence model with the Fixed Effect panel regression analysis approach; testing analytical tools used the Hausman Test, Chow Test, and statistical tests. The regression results of the fixed effect model revealed that the occurrence of absolute HDI convergence in districts/cities in Aceh. The estimation of conditional convergence indicated that population density played a significant and significant role in driving the convergence of HDI districts/city. Special autonomy funds had a positive influence but were not significant to encourage the HDI convergence process. It was also followed by the number of working people who did not significantly influence the HDI. Therefore, policymakers in districts/cities in Aceh must continue to pay serious attention in an effort to accelerate human development, through human development priorities sourced from Aceh's special autonomy fund.

Keywords: *Special Autonomy Funds, Convergence, Human Development Index*



A. Introduction

Over the past few decades, the policies of regional autonomy and fiscal decentralization from the central government to the regions have been implemented in many countries. Indonesia officially implemented Regional Autonomy in 2001 which was followed by the granting of authority delegation and fiscal transfers to the regions. Specific fiscal transfer policies or special treatment are also applied by the Government of Indonesia, especially for the Aceh Province and Papua Province. In 2008, Aceh officially obtained a special autonomy fund transfer from the Indonesian Government as mandated by Law No. 11/2006 concerning the Government of Aceh (UUPA). Special autonomy fund transfers received by Aceh are equivalent to 2 percent of the total National General Allocation Fund (GAF) for a period of 15 years and equivalent to 1 percent for the next 5 years. At the beginning of 2008, the number of special autonomy funds amounted to Rp. 3.59 trillion, significantly increasing the amount of regional income to almost Rp. 16 trillion compared to 2007 which only amounted to Rp. 11.6 trillion (World Bank, 2008).

Special autonomy funds are intended to finance and fund to fund the construction and maintenance of infrastructure, community economic empowerment, poverty alleviation, and financing the education, social and health sectors. The special autonomy fund is a gift that is expected to provide long-term benefits in an effort to improve the welfare of the community and encourage economic growth and quality human development in a fair and equitable manner in the districts/cities in Aceh. Although regional revenues in all District/City Governments have increased dramatically, the impact on human development progress can still be questioned. In this connection, the question that arises is whether the transfer of special autonomy funds can reduce the gap or the occurrence of convergence in human development between districts/cities in Aceh.

The theoretical studies of convergence have been extensively investigated and widely publicized. Almost all studies test the convergence hypothesis by analyzing income inequality between countries, such as the Neoclassical growth model, Barro (1991), Barro and Sala-i-Martin (1995),



and Heng and Siang (1999). Two conventional concepts are most often applied, called β -convergence and σ -convergence. Convergence related to the Human Development Index has been traced by Mazumdar (2002), Sutcliffe (2004) and Noorbakhsh (2006). Another study was conducted by Konya and Guisan (2008) who used conventional concepts and tests for β -convergence and σ -convergence which resulted in the world being converged in the sense that relatively underdeveloped countries managed to increase their HDI faster than the average developed countries, even though the convergence process is rather slow.

In India, research related to human development and its convergence characteristics has been carried out by Dholakia (2003), Noorbakhsh (2003), Ghosh (2006), Roy and Bhattacharya (2009), Gaur (2010), and Banerjee and Kuri (2015). Noorbakhsh (2003) proves that there is a difference between β and α for human welfare in the major countries of India during the years 1981-1991. Meanwhile, Roy and Bhattacharya (2009) state that absolute β convergence in HDI is not significant α -convergence during 1981-2001. Banerjee and Kuri (2015) found that HDI convergence in India was more influenced by the components of the labor force participation rate, literacy rate, percentage of population below the poverty line, maternal mortality rate, and student-teacher ratio.

Other research was conducted by Jorda and Sarabia (2014) who tested the concept of beta convergence in cross-country living standards during the period 1980-2012. His findings indicate that there is absolute convergence for human well-being (HDI indicators) through conventional linear specification models. On the other hand, the income and education index shows a non-linear pattern and the speed of convergence of all indicators is higher and linear but does not apply to the health index.

Convergence research which focuses on the disparity in economic growth and HDI for developing countries has been carried out. However, at the local level (district/city) including for Aceh, it is still very limited. Besides that, linking special autonomy funds and HDI convergence and other socio-economic variables is a novelty in this study. Special autonomy funds are



specific fiscal transfers received by Aceh in accordance with the mandate of Law No. 11/2006. Except for Papua and Aceh, none of the districts/cities in Indonesia have special autonomy funds. Thus, the results of this study are scientific input that can be used as a reference for the Regency/City Government and the Government of Aceh in an effort to encourage the progress of accelerating human development in the future.

B. Method

This study uses secondary data in the form of panel data covering 23 districts/cities in Aceh from 2008-2017. Secondary data sources were obtained from official publications of District/City Governments in Aceh, Central Bureau of Statistics (CBS), District/city Bappeda in Aceh, and Aceh Governor's Office. Periodic secondary data from 2008-2017, including HDI, Special Autonomy (SA) by regency/city, Poverty Level (PL), Population Density (PD), number of Working Population (WP) in district/city in Aceh. Descriptive statistics of the research variables are as follows.

Table 1. Descriptive Statistics

	HDI	LOG(DO)	KM	LOG(KP)	LOG(PB)
Mean	68.39817	4.754010	19.92639	4.675038	11.11379
Median	68.26500	4.724818	19.54000	4.255588	11.13839
Maximum	83.95000	11.26581	201.8000	8.405144	12.28875
Minimum	58.97000	3.821879	7.410000	2.564949	9.326077
Std. Dev.	4.739624	0.697967	12.90122	1.264276	0.661457
Skewness	0.655122	7.004076	12.22695	1.173050	-0.412315
Kurtosis	3.840668	66.63379	173.2795	4.311129	2.865543
Jarque-Bera	23.22486	40685.92	283600.5	69.22273	6.690075
Probability	0.000009	0.000000	0.000000	0.000000	0.035259
Sum	15731.58	1093.422	4583.070	1075.259	2556.172
Sum Sq. Dev.	5144.265	111.5592	38115.11	366.0319	100.1934
Observations	230	230	230	230	230

The analysis model used is the convergence model with a panel regression analysis approach accompanied by testing the analytical tool

used. For the analysis model, the Fixed Effect and Random Effect models are used. Testing the analysis tool using the Chow Test, Hausman Test, and statistical tests.

1. Analysis Model

a. Fixed Effect Model

Fixed effect models are formulated as follows:

$$Y_{it} = \alpha_i + X_{it} + e_{it}$$

b. Random Effect Model

In the Random Effect model, it is assumed that there is an intercept difference for each individual and each individual is a random or stochastic variable. The Random Effect form is explained in the following equation:

$$Y_{it} = \alpha_i + X_{it} + U_i + e_{it}$$

$$Y_{it} = \alpha_i + X_{it} + w_{it} \quad \text{Where: } w_{it} = U_i + e_{it}$$

Some assumptions that must be met in the Random Effect model are:

$$u_i \sim N(0, \delta u^2)$$

$$e_{it} \sim N(0, \delta e^2)$$

$$E(u_j + e_{it}) = 0 \quad \text{for all } i, j, \text{ and } t$$

$$E(u_i + e_j) = 0 \quad \text{if } (i \neq j)$$

$$E(e_{it} + e_{jt}) = 0 \quad \text{if } (i \neq j) \text{ or } (t \neq s)$$

This means that the error component does not correlate with each other, including also there is no autocorrelation between the cross-section and the time series.

2. Testing Analysis Tool

a. Hausman Test

Hausman Test is a statistical test as a basis for consideration in choosing whether to use a fixed-effect model or random-effect model. Hausman statistical value follows the chi-square distribution as follows:



$$W = [\tilde{\beta} - \tilde{\beta} \text{GLS}] \Sigma^{-1} [\tilde{\beta} - \tilde{\beta} \text{GLS}]$$

where $\Sigma = \text{Var} [\tilde{\beta} - \tilde{\beta} \text{GLS}] = \text{Var} [\tilde{\beta}] - \text{Var} [\tilde{\beta} \text{GLS}]$

(4)

As a basis for rejecting the null hypothesis, Hausman statistics are used and compared with Chi-Square K-free tables. If the Hausman statistical value is greater than the critical value of Chi-Square statistics, the null hypothesis will be rejected, which means the estimation of the Fixed Effect model is better than the Random Effect model.

b. Statistic Test

Statistical testing is intended to find out whether the model used is the right model to describe the relationship between variables and whether there is a significant relationship between the dependent variable and the independent variable, consisting of the t-test, F-test and coefficient of determination R^2 .

3. Convergence Model

Beta convergence is used to measure the convergence of the human development index in Aceh. Beta convergence consists of absolute convergence and conditional convergence. To measure absolute convergence the panel data regression equation is used as follows:

$$\frac{\ln(y_{i,T}) - \ln(y_{i,t-1})}{T} = \alpha + \beta \ln(y_{i,t-1}) + u_{it}$$

where y is the human development index, i shows the region and T denotes the time period from the initial year of study ($t-1$) and until the end of the year, T . α is the constant and β coefficient of the initial human development index. If the coefficient value is negative or less than zero, it means convergence, and if the value is positive it means there is a divergence of the human development index.

To find out conditional convergence panel data regression is used with the addition of several control variables (referred to as exogenous variables). The estimation used to measure conditional convergence is the panel data regression equation from Baro and Sala i-Martin (1991, 1992,

1995, 2004) and several applications from other researchers with the following equation:

$$\frac{\ln(y_{it}) - \ln(y_{it-1})}{T} = \alpha + \beta \ln(y_{it-1}) + \sum_{j=1}^k \theta_j \ln(X_{it-1}^j) + u_{it}$$

where X_{it-1}^j is an exogenous variable which is estimated to contribute to the human development index.

Other methods for measuring beta convergence generally require an estimate of the equation proposed by Manfort (2008), namely:

$$\ln(Y_{it}) = \alpha_i + \beta \ln Y_{it} + Z_{it} + u_{it}$$

where Z_{it} is another factor that affects the human development index.

Another measurement for measuring conditional convergence is the estimation formula from Lall and Yilmaz (2001) with the panel data regression equation as follows:

$$\text{Log}(Y_{it}) = \alpha_i - \beta \text{Log}Y_{it-1} + C_k Z_{kit-1} + d_i D_i + e_i T_t$$

Where Z is a vector of additional regional characteristics k and D are vectors of regional dummy variables. The T is a vector of time t the dummy variable.

Based on these equations, the estimation model used in this research variable is as follows:

$$IPM_{it} = \alpha_i + \beta_1 \log HDI_{it-1} + \beta_2 \log DO + \beta_3 KM_{it} + \beta_4 \log KP + \beta_5 \log PB_{it} + e_{it}$$

Where:

- α : constants;
- $\beta_1, 2, 3, \dots, n$: parameter or elasticity coefficient of each variable;
- HDI_{it} : regional human development index i in year t ;
- HDI_{it-1} : regional human development index i in year t before;
- DO_{it} : Special autonomy fund i in year t ;
- KM_{it} : Percentage of poor people in area i in year t
- KP_{it} : Regional population density i in year t ;
- PB_{it} : Percentage of Regional Working Population i in year t

C. Finding and Discussion

1. Trends in Special Autonomy Funds, HDI, and The Poor

Special autonomy funds are one of the sources of Aceh and Regency/City Revenues as contained in article 197 paragraph 2c of Law No.



11/2006. Special autonomy funds are intended to finance development, especially the construction and maintenance of infrastructure, people's economic empowerment, poverty alleviation and educational, social and health funding (Article 183 paragraph 1 of the Aceh Government Law). Overall the special autonomy funds allocated to district/city governments in Aceh during the period 2008-2017 continued to increase along with the increase in the National General Allocation Fund (Table 2).

During the period 2008-2017, except for balance funds, the special autonomy fund made the largest contribution to the revenue of the regency/city Government in Aceh compared to other revenue components, such as Regional Original Income (ROI). This illustrates that the district/city Government in Aceh is still very dependent on the acceptance of special autonomy funds in financing development and providing services to the community, and this condition is not good for fiscal independence in the long run. Moreover, income from the special autonomy fund is a type of income that does not guarantee continuity.

The acquisition and distribution of special autonomy funds varies from district to city. In 2008, the regions that obtained more funds included East Aceh District, Gayo Lues, Nagan Raya, South Aceh, and Central Aceh. In 2017, the largest special autonomy fund transfers were dominated by East Aceh, Gayo Lues, Nagan Raya, South Aceh, and Southeast Aceh. There is no change in position, which means that the district/city is the biggest recipient of special autonomy funds, given the distribution and allocation of funds transfers based on established rules. It is a good idea to reconsider the distribution of funds that takes into account the achievements of development progress and the problems that exist in each district/city.

Table 2. Trend of District/City Special Autonomy Funds in Aceh in 2008-2017 (Rp. million)

District/City	Year					
	2008	%	2012	%	2017	%
Simeulue	89.920	4,25	106.151,78	3,92	129.993,18	3,84
Aceh Singkil	89.390	4,22	116.767,95	4,31	118.138,81	3,49
South Aceh	115.930	5,47	141.107,34	5,21	176.920,35	5,22
South East	102.220	4,83	144.032,45	5,32	175.095,44	5,17

Aceh						
East Aceh	157.520	7,44	203.315,35	7,51	252.512,20	7,45
Central Aceh	114.210	5,39	135.798,26	5,02	166.831,32	4,92
West Aceh	93.590	4,42	118.179,36	4,37	145.172,82	4,28
Aceh Besar	98.300	4,64	138.327,92	5,11	165.687,09	4,89
Pidie	93.330	4,41	134.413,54	4,97	174.184,09	5,14
Bireuen	91.790	4,33	124.063,25	4,58	144.746,63	4,27
North Aceh	100.710	4,75	138.766,78	5,13	178.692,37	5,27
Southwest Aceh	78.300	3,70	107.873,20	3,99	126.398,38	3,73
Gayo Lues	151.300	7,14	168.055,43	6,21	212.139,54	6,26
Aceh Tamiang	94.270	4,45	107.646,46	3,98	149.383,161	4,41
Nagan Raya	118.880	5,61	136.282,85	5,04	183.468,756	5,41
Aceh Jaya	110.060	5,20	138.679,17	5,12	163.831,99	4,83
Bener Meriah	77.390	3,65	95.558,17	3,53	127.365,36	3,76
Pidie Jaya	55.090	2,60	83.710,61	3,09	98.263,71	2,90
Banda Aceh	52.080	2,46	71.225,64	2,63	128.838,66	3,80
Sabang	45.690	2,16	57.420,81	2,12	74.736,89	2,21
Langsa	62.260	2,94	76.623,40	2,83	92.168,29	2,72
Lhokseumawe	61.930	2,92	71.691,68	2,65	87.941,47	2,59
Subulussalam	63.850	3,01	90.702,37	3,35	116.403,56	3,43
Summary	2.118.010	100	2.706.393,89	100	3.388.914,15	100
Aceh	147.213,28		2.769.894,86		4.318.302,78	

Source: Central Bureau of Statistics Aceh, 2018

HDI is one indicator to measure the progress of development in a region. HDI is formed based on three dimensions: namely longevity, knowledge, and standard of living (standard of living) in a region (UNDP, 1990). HDI is a policy tool (Spangenberg, 2015) which is a comprehensive result of various factors (Niu et al., 2013). High HDI shows the success of health, education and economic development. On the contrary, low HDI shows the failure of the development of health, education, and the economy of a region. From 1995-2009, the Human Development Report used a set of indicators for maximum and minimum values for life expectancy at birth, adult literacy rates, and gross enrollment rates and real GDP per capita. In its development, the 2010 Human Development Report (HDR 2010), introduced several improvements to HDI. The report presents new indicators for HDI, including the average length of the school and school life expectancy in lieu of gross enrollment and adult literacy rates and Gross National Income replacing Gross Domestic Product (GDP).



The highest rating of HDI in Aceh is dominated by urban areas, which include regions not the biggest recipients of special autonomy funds, such as Banda Aceh City, Lhokseumawe, Langsa, and Sabang. This situation still occurs throughout 2008-2017, although the HDI of Sabang City in 2008 was ranked 7th, out of 23 regencies/cities in Aceh. The city of Banda Aceh, as the center of the government of Aceh has a very high HDI value of 83.95 in 2017, an increase from 2008 which was 76.74. Availability of adequate public service facilities (education, health, and infrastructure) and better access to employment, it is very reasonable that the progress of human development in Banda Aceh City is far better than other districts/cities in Aceh.

The city of Lhokseumawe once nicknamed the petrodollar region in Aceh because of the availability of large industries (PT Arun, PT PIM, PT AAF) ranked second with an HDI value of 76.34 in 2017. Then, Langsa City with HDI was 75.89. On the other hand, the smallest areas of HDI were 62.88, namely Subulussalam City, Simeulue Regency with 64.41, and South Aceh District with 65.03. The Human Development Index according to districts/cities in Aceh during 2008-2017 is presented in (Table 3).

Table 3. Aceh Human Development Index (HDI) 2008 - 2017

Regency/City	Year/Ranking					
	2008	Ranking	2012	Ranking	2017	Ranking
Simeulue	68,60	18	61,25	22	64,41	22
Aceh Singkil	68,12	22	64,23	17	67,37	17
South Aceh	69,18	20	61,69	21	65,03	20
South East Aceh	70,99	11	64,99	14	68,09	12
East Aceh	69,55	15	62,93	18	66,32	18
Central Aceh	72,81	5	70,18	5	72,19	5
West Aceh	69,66	14	66,66	11	70,20	10
Aceh Besar	72,84	4	70,10	6	72,00	6
Pidie	71,21	10	67,30	10	69,52	11
Bireuen	72,60	6	67,57	9	71,11	9
North Aceh	71,47	8	64,82	16	67,67	16
Southwest Aceh	69,38	16	62,15	20	65,09	19
Gayo Lues	67,17	23	62,85	19	65,01	21
Aceh Tamiang	69,81	12	65,21	13	67,99	14



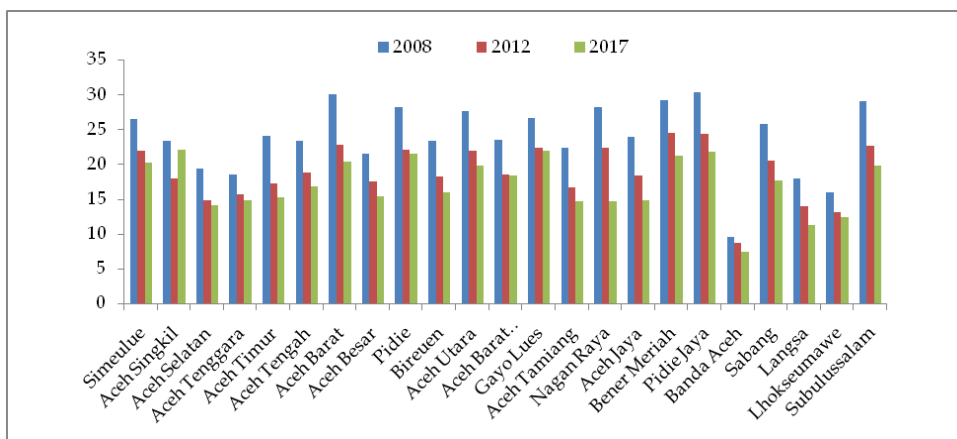
Regency/ City	Year/Ranking					
	2008	Ranking	2012	Ranking	2017	Ranking
Nagan Raya	68,47	19	64,91	15	67,78	15
Aceh Jaya	68,94	17	66,42	12	68,07	13
Bener Meriah	69,77	13	69,14	7	71,89	7
Pidie Jaya	71,23	9	68,90	8	71,73	8
Banda Aceh	76,74	1	81,30	1	83,95	1
Sabang	75,00	3	70,84	4	74,1	4
Langsa	72,29	7	72,75	3	75,89	3
Lhokseumawe	75,00	2	73,55	2	76,34	2
Subulussalam	68,42	21	59,76	23	62,88	23

Source: Central Bureau of Statistics Aceh, 2018

In 2008, bags of the poor with a percentage above 20 percent were distributed in almost 16 districts and 2 cities (table 4). Then in 2012, it has changed to 8 regencies and 2 cities, which indicates a reduction in the poor population for five years from the implementation of special autonomy policies in Aceh. In 2017, areas with a poor population above the remaining 20 percent are 7 districts, from 23 regencies/cities. The highest percentage of poor people is concentrated in Singkil and Gayo Lues Districts, each at 22.11 percent and 21.97 percent. In fact, Gayo Lues is the second-largest recipient of special autonomy funds, after East Aceh Regency, it is still squeezed from the problem of poverty.



Figure 1. Poor People According to Districts/Cities in Aceh in 2008-2017 (Percent)



Source: Central Bureau of Statistics Aceh, 2018

The working population is an important factor in the production process, in addition to capital resources. More and more residents who work will accelerate economic activity and have an impact on increasing income and people's welfare. In Aceh, adequate working populations were concentrated in Bireuen District, in addition to North Aceh, Pidie, East Aceh and Aceh Besar Districts (Table 4). There was no drastic change in the distribution of population working in the district/city, during the period 2008-2017.

Table 4. Residents Work According to District/City in Aceh in 2008-2017 (Person)

Regency/City	Year					
	2008	%	2012	%	2017	%
Simeulue	27.825	1,72	30.656	1,70	37.115	1,74
Aceh Singkil	33.963	2,09	37.370	2,08	41.096	1,92
South Aceh	76.588	4,72	84.138	4,67	90.266	4,22
Southeast Aceh	56.985	3,51	71.705	3,98	94.380	4,41
East Aceh	119.808	7,39	143.999	8,00	150.863	7,05
Central Aceh	90.944	5,61	82.603	4,59	102.584	4,80
West Aceh	60.133	3,71	69.510	3,86	82.162	3,84
Aceh Besar	106.795	6,58	133.310	7,40	157.096	7,35
Pidie	155.561	9,59	166.509	9,25	177.381	8,29
Bireuen	144.013	8,88	155.171	8,62	217.238	10,16
North Aceh	163.269	10,07	190.591	10,58	209.742	9,81
Southwest Aceh	48.354	2,98	44.026	2,44	61.960	2,90
Gayo Lues	29.907	1,84	40.825	2,27	44.112	2,06
Aceh Tamiang	93.622	5,77	104.232	5,79	115.753	5,41

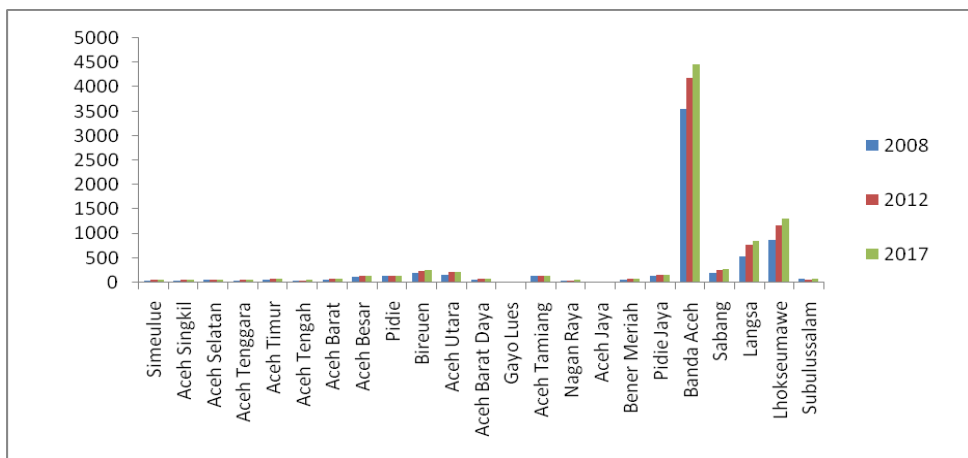


Regency/City	Year					
	2008	%	2012	%	2017	%
Nagan Raya	56.470	3,48	56.491	3,14	69.119	3,23
Aceh Jaya	25.114	1,55	32.719	1,82	39.848	1,86
Bener Meriah	54.741	3,37	60.943	3,38	76.217	3,56
Pidie Jaya	50.380	3,11	56.235	3,12	62.322	2,91
Banda Aceh	93.730	5,78	90.944	5,05	110.184	5,15
Sabang	12.127	0,75	11.227	0,62	16.084	0,75
Langsa	49.351	3,04	55.837	3,10	78.465	3,67
Lhokseumawe	50.383	3,11	58.804	3,27	77.021	3,60
Subulussalam	21.935	1,35	22.954	1,27	27.774	1,30
Summary	1.621.998	100,00	1.800.799	100,00	2.138.782	100,00

Source: Central Bureau of Statistics Aceh, 2018

In the period 2008-2017, high population densities were dominated by urban areas, including Banda Aceh, Lhokseumawe, Langsa, and Sabang (Figure 2). Ideally, population density can encourage an increase in HDI considering the population as a potential to expand market share and concentrated economic activities which ultimately increases people's income.

Figure 2. Population Density According to Districts/Cities in Aceh in 2008-2017 (Person/km²)



Source: Central Bureau of Statistics Aceh, 2018

2. HDI Convergence Analysis

a. Absolute Convergence

In accordance with the theory of convergence proposed by Barro and Sala-i Martin (2004), the calculation of the β convergent is divided



into two, namely absolute and conditional convergence. Absolute convergence is used to observe HDI convergence at the start and conditional convergence observes the influence of special autonomy funds and other independent variables (population density, working population, and poor population) that have an impact on HDI convergence in Aceh.

Table 4 shows the results of the estimation of absolute HDI convergence in Aceh. In absolute convergence analysis using OLS dynamic panel, it was found that the convergence process between districts/cities in Aceh occurred. This can be seen from the coefficient of the HDI lag which is less than one, which is equal to 0.9270 which is statistically significant at the 0.01 and 0.05 significant levels. In other words, there has been a convergence of HDI in Aceh during the implementation of special autonomy funds in Aceh (2008-2017 period). The occurrence of HDI convergence in Aceh means that the increasingly advanced regions of HDI are already optimal and areas that are slow to progress in HDI are increasingly moving, in line with the implications of the existence of special autonomy funds that are used in education and health development. Thus, catching up has taken place towards the steady-state.

Human development convergence (HDI) that occurs between districts/cities in Aceh, is in line with the findings of Noorbakhsh (2006) and Konya and Guisan (2008). Noorbakh found interstate convergence during 1975-2002 with a very slow pace of convergence during this period. While Konya and Guisan who observed HDI during the period 1975-2004 among 101 countries, also tended to be convergence, although underdeveloped countries needed a long time, almost nine decades.

Meanwhile, referring to the findings of Guisan, Aguayo, and Exposito (2001), Guisan and Aguayo (2007) and Guisan and Exposito (2006), it should be considered further that districts/cities in Aceh need comprehensive efforts to encourage further convergence in the acceleration human development. The role of education, in addition to



increasing spending on health and per capita income for districts/cities whose HDI is still low (below the average HDI Aceh) is important to prioritize.

Table 5. Estimation of Absolute Convergence Regression

Variable	Coefficient (t-Statistics)	Probability	Results
C	4.861010 (2.289531)	0.0231	
HDI(-1)	0.927030 (29.86926)	0.0000	Significant
R-squared			0.813156
Adjusted R-squared			0.812245
Durbin-Watson stat			2.303646
F-statistic			892.1728
Prob(F-statistic)			0.000000

Source: Results of Processing EViews 9.0

b. Conditional Convergence

The positive and significant findings of the absolute convergence model require further conditional convergence models. Referring to the results of the Chow and Hausman test, the fixed effect model is more suitable than the Random Effect model to assess HDI's conditional convergence in Aceh that is associated with the Aceh special autonomy fund and other independent variables. The Chow test results as shown in table 6 and the Hausman test results in table 7.

Table 6 Chow Tests

Effects Test	Statistic	d.f.	Prob.
Period F	33.958702	(8,193)	0.0000

Source: Data Processed

Table 7. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	249.348843	5	0.0000

Source: Data Processed



Table 8 shows the results of the estimation of conditional convergence in Aceh. In conditional convergence analysis using the Dynamic Fixed Effect panel, it was found that the convergence process between districts/cities occurred. This can be seen from the coefficient of HDI lag which is less than one, which is equal to 0.7822 which is significant at the real level of one percent. However, in other explanatory variables, the special autonomy fund, the poor, population density, and working population showed varied results. Only the population density variable which is very instrumental in supporting the convergence of HDI districts/cities in Aceh and is significant at the real level of one percent.

Table 8. Estimation of Conditional Convergence of Fixed Effect Models

Variable	Coefficient (t-Statistics)	Prob	Result
C	11.07043 (3.290280)	0.0001	
HDI(-1)	0.782274 (18.37157)	0.0000*	Significant
LOG(DO)	0.226526 (1.140405)	0.2555	Not significant
KM	-0.020466 (-1.564209)	0.0599**	Significant
LOG(KP)	0.734205 (4.400552)	0.0000*	Significant
LOG(PB)	-0.041319 (-0.186033)	0.8526	Not Significant
R-squared			0.838594
Adjusted R-squared			0.834579
Durbin-Watson stat			2.284270
F-statistic			208.8614
Prob(F-statistic)			0.000000

Source: Results of Processing EViews 9.0

*) significant level 1%, **) significant level 10%

The special autonomy fund which is a transfer from the Central Government to Regency/ City Governments in Aceh as a stimulus to improve community welfare and human development also shows a positive influence but is not significant to encourage the process of convergence of human development. In accordance with its rules, special autonomy funds



are used to finance and fund the construction and maintenance of infrastructure, community economic empowerment, poverty alleviation, and financing the education, social and health sectors.

The broad scope of utilization of these funds allows a small impact in encouraging the acceleration of human development convergence in Aceh. As an important note, Gayo Lues Regency as the second-largest recipient of special autonomy funds only ranked 21st HDI from 23 regencies/cities in 2017. Nine years ago, the HDI ranking was 23rd, which is the last rating of human development Aceh.

Research conducted by Barro (1990) and Aritenang (2009) states that in order to overcome gaps in each region, budget transfers from the central government are needed to local governments to accelerate the process of convergence. The findings above have been applied by the Central Government with a special autonomy fund transfer policy in Aceh. Ideally or theoretically, the transfer of funds from the central government which is then implemented for expenditures by the district/city government for development such as education, facilities and infrastructure, transportation, and health can be determinants of the development process in each district/city so that the level of disparity between districts/cities can decline.

The population that works has a negative coefficient and does not significantly affect HDI. The data used in this study were only the number of working-age population, but did not see the level of education, competence, and training that had been followed by workers thus ignoring worker productivity. In general, the condition of the workforce education in Aceh is still low. At least 31.82 percent of the workforce has high school education and almost 24.67 percent are junior high school education (Aceh Central Bureau of Statistics, 2017). The workforce with high education is 12.78 percent. This situation is not much different from the actual conditions of the workforce in each district/city in Aceh.

Based on the estimation of the fixed effect model, a negative coefficient value is obtained and a significant level of 10 percent is



significant between poverty and HDI. The elasticity of the poor population of HDI is -0.020, which means that for every 1 percent increase in poverty in districts/cities in Aceh, HDI decreases by 0.020 percent. Therefore, efforts to reduce poverty in pockets of many poor people (above 20 percent) are needed, especially Aceh Singkil, West Aceh, Simeulue, Pidie, Gayo Lues, Bener Meriah, and Pidie Jaya. Sustainable poverty reduction is expected to accelerate the convergence of human development in Aceh.

Efforts to improve the quality of human resources by district/city governments in Aceh can be achieved through increasing labor productivity that can be implemented through increased training and education. Training and education can be one way to transfer technology, information, and knowledge in production. Thus, through training and education, workers will be able to have expertise in better production which is expected in the long run to have a positive impact on human development.

D. Conclusion

Absolute convergence based on the fixed effect model proves that there is convergence in human development as measured by HDI according to districts/ cities in Aceh or not the occurrence of divergence. However, estimates of conditional convergence show alarming findings. It was recognized that the special autonomy fund had a positive effect on HDI, but it was not significant to encourage the HDI convergence process. Abundant special autonomy funds have not been fully able to significantly encourage the equal distribution of human development in Aceh. Ideally, the transfer of special autonomy that has received the District/City Government in Aceh since 2008 has been able to encourage improvements in community welfare as measured by HDI. Likewise, the variable number of working people turned out to be insignificant in encouraging HDI convergence.



Regarding these findings, the Aceh Government and Regency/City Governments in Aceh should continue to make efforts to accelerate the convergence of human development, through the implementation of development programs that can support the acceleration of HDI improvements, such as education and health development expenditures, and economic empowerment directed at regions areas where human development achievements are below the Aceh average.

This study only examines a number of variables in looking at HDI convergence in Aceh. The limitations of this study are the basis for other researchers to look further and comprehensively analyze other factors related to human development convergence. Other variables, such as per capita health expenditure, per capita education expenditure, capital expenditure, and non-economic variables (corruption index) can be considered for the continuation of this research in the future. Capital expenditure is thought to have a greater impact on society. For the corruption index, this is reinforced by the many cases of corruption in Indonesia, including Aceh, which need to be studied carefully and their effects on the convergence of human development.

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