

Economic Growth and Human Development Index of Province in Indonesia (*Pertumbuhan Ekonomi dan Indeks Pembangunan Manusia di Indonesia*)

Petrus Christian Mboeik¹, Suryati Maryam Mandala¹, Bernadus Elli¹, Yohanes Museng Ola Buluamang¹, Heyn Peter Ahab², Rioavianto³, Roliviyanti⁴, Fellyanus Haba Ora⁵

¹Departement of English Education, Faculty of Social Sciences & Humanities, University of Nusa Lontar Rote

²Departement of History, Faculty of Social Sciences & Humanities, University of Nusa Lontar Rote

³Departement of Geography, Faculty of Social Sciences & Humanities, University of Nusa Lontar Rote

⁴Departement of Law, Faculty of Social Sciences & Humanities, University of Nusa Lontar Rote

⁵Departement of Agrotechnology, Faculty of Social Sciences & Humanities, University of Nusa Lontar Rote

Unstar Complex, Jl. Jamin Habid, Mokdale, Ba'a, Rote Ndao Regency, East Nusa Tenggara, 85914

Email correspondence: irpetruschmboeik@gmail.com

Abstract - The purpose of this research is to analyze the pattern and long-term relationship between economic growth and the human development index of provinces throughout Indonesia using Klassen typology to determine the pattern of relationships and cointegration methods to see the long term. The scope of this research is 34 provinces in Indonesia using time series data for the period 2014-2020. The results showed that using Klassen's typology, there were 6 provinces that were categorized as fast-forward and fast-growing (quadrant I), for fast-developing areas (quadrant II), there was one province and developed but depressed regions (quadrant III) were 27 provinces. Provinces in Indonesia are no longer classified as underdeveloped regions because there are no more provinces in quadrant IV. Meanwhile, the cointegration test results show that there is a long-term balance relationship between economic growth and the human development index of the provinces in Indonesia. Economic growth policies through the development of the human development index need to be improved by the Government of Indonesia to spur Indonesia's economic growth through indispensable components of the HDI, such as boosting the productivity of the Indonesian population, equitable access to development, sustainable national development, and empowering the population through the national creative economy.

Keywords: economic growth, human development index, Klassen typology, cointegration test

Abstrak – Tujuan penelitian ini adalah untuk menganalisis pola dan hubungan jangka panjang antara pertumbuhan ekonomi dan indeks pembangunan manusia provinsi se-Indonesia menggunakan tipologi Klassen untuk mengetahui pola hubungan dan metode kointegrasi untuk melihat jangka panjang. Ruang lingkup penelitian ini adalah 34 provinsi se-Indonesia menggunakan data timeseries periode tahun 2014-2020. Hasil penelitian menunjukkan bahwa dengan menggunakan tipologi Klassen, terdapat 6 provinsi yang masuk dalam kategori cepat maju dan cepat tumbuh (kuadran I), untuk daerah berkembang cepat (kuadran II) terdapat satu provinsi dan daerah maju tetapi tertekan (kuadran III) terdapat 27 provinsi. Provinsi-provinsi di Indonesia tidak tergolong lagi sebagai daerah yang tertinggal karena tidak ada lagi provinsi yang berada pada kuadran IV. Sementara itu, hasil uji kointegrasi menunjukkan bahwa terdapat hubungan keseimbangan jangka panjang antara pertumbuhan ekonomi dan indeks pembangunan manusia provinsi-provinsi di Indonesia. Kebijakan pertumbuhan ekonomi melalui pengembangan indeks pembangunan manusia perlu ditingkatkan oleh Pemerintah Indonesia untuk memacu pertumbuhan ekonomi Indonesia melalui komponen IPM sangat diperlukan seperti memacu produktivitas penduduk Indonesia, pemerataan akses pembangunan, kesinambungan pembangunan nasional, dan pemberdayaan penduduk melalui ekonomi kreatif nasional.

Kata Kunci: pertumbuhan ekonomi, indeks pembangunan manusia, tipologi Klassen, uji kointegrasi

1. INTRODUCTION

The economic performance of a region can be assessed from the existing economic growth in a region,

both at the levels of national and regional. According to (Lumbantoruan & Hidayat, 2014), economic growth is a process that shows the production capacity of an economy increases over time to generate higher levels of

income. Indonesia's economic growth is in the range of 4.88-6.17% during the period between 2010-2020.

(Peterson, 2017) defines economic growth as an increase in the long-term capacity of a country to provide various types of goods and services to the population. (Saleh, Surya, Ahmad, & Manda, 2020) explains the various factors that affect economic growth consisting of 3 main components, namely: *first*, capital accumulation, which includes all new forms or types of investments invested in land, physical equipment, and human capital or human resources. *Second*, population growth which in turn will increase the number of the workforce. *Third*, technological progress which in its simplest sense occurs because of the discovery of new ways or improvements to old ways of handling a job.

The long-term economic growth of a country is not only supported by an increase in the stock of physical capital and the number of workers, but also improving the quality of human capital which has a strong influence on improving the quality of the workforce and use of technology (Wardhana, 2016). Human development can be done by improving several aspects that are important for human life, namely life age, education, and a decent standard of living. Based on these several aspects, UNDP (United Nation Development Program) in the publication of the Body of Central Statistics has set the standards for measuring human resource development as contained in the Human Development Index (HDI).

The human development index is one indicator to measure the level of physical and non-physical quality of the population (Monteiro, Pereira, & Costa, 2018). The physical quality is reflected in the number of life expectancy, while the non-physical quality is through the average length of time the population attends school and the literacy rate. The Human Development Index (HDI) as an indicator of people's welfare has been improving over the last two decades, although the pace of improvement is relatively lagging behind that of neighboring countries.

Contrary to popular belief so far, inequality in human development (HDI) in Indonesia tends to get smaller. In 2011, the HDI in Sumatra, Java, and Bali was generally above the national average (72.77) while the HDI in areas outside Java, Sumatra and Bali (Central and Eastern Indonesia) was generally below the average. the national average, except for Central Kalimantan, East Kalimantan and North Sulawesi. Meanwhile, underdeveloped regions such as East Nusa Tenggara, West Nusa Tenggara, and Papua have also experienced faster progress in HDI levels than other regions.

Economic growth increases the supply of resources needed for human development. Increased resources together with proper allocation of resources and wider distribution of opportunities, especially employment opportunities will encourage better human development. This also applies to the contrary, human development encourages increased economic growth. A high level of human development very determines the ability of the population to absorb and manage sources of economic growth, both in relation to technology and to institutions as an important means of achieving

economic growth. (Lumbantoruan & Hidayat, 2014); (Lilya Santika Dewi & Sutrisna, 2014); (Asnidar, 2018); (Siregar & Tanjung, 2020)).

Based on the description that has been explained, the relationship between human development and economic growth can be understood from 2 (two) directions, namely the influence of economic growth on human development and the influence of human development on economic growth. The relationship between economic growth and human development cannot be considered linear or direct, but is determined by the extent to which the factors that link the two concepts play a role. Therefore, researchers are interested in observing and analyzing the relationship between economic growth and the Human Development Index (HDI) of provinces throughout Indonesia (Cointegration Method).

Thus, the problems that will be analyzed in this study are (1) how is the pattern of the relationship between economic growth and the Human Development Index (HDI) of provinces throughout Indonesia? and (2) is there a cointegration relationship (long-term balance) between economic growth and the Human Development Index (HDI) of provinces throughout Indonesia.

2. RESEARCH METHODS

This study examines the analysis of economic growth and human development index (HDI) of provinces in Indonesia using the cointegration method during the period 2014-2020. The scope of this research is carried out in 34 provinces in Indonesia.

This study uses panel data, which is a combination of time series data for 7 years and cross-section data for 34 provinces, thus forming a total of 238 data observed (34 provinces over a 7 year period) obtained from the Central Statistics Agency. in the form of economic growth rates and data on the human development index (HDI) of provinces in Indonesia.

Analysis Method

The analytical method in this study uses quantitative analysis using panel data. The analytical model used to see the pattern of the relationship between economic growth and the human development index (HDI) of provinces in Indonesia is the Klassen Typology analysis and to examine the long-term equilibrium relationship is the cointegration test.

Klassen typology. Each region has different progress and economic growth. There are regions that are able to spur economic activity so that they can grow rapidly and there are also regions whose economic cycles stagnate at one point or even grow negatively. To be able to compare the level of progress of an area with other regions within the same reference scope, the Klassen Typology can be used as an analytical tool, as presented in Table 1.

Table 1. Classification of regions according to Klassen Typology analysis

r	y	
	$y_i > y$	$y_i < y$
$r_i > r$	Quadrant I Area of Fast Forward and Fast Developing	Quadrant II Fast Developing Area
$r_i < r$	Quadrant III Depressed Area	Quadrant IV Relatively Underdeveloped Area

Information: r_i = Regional economic growth rate-i
 y_i = IPM region-i
 r = Reference area economic growth rate
 y = Reference region HDI

The Klassen typology grouped the regions based on two characteristics possessed by the area, namely the Human Development Index (HDI) and the rate of economic growth. The results of this analysis obtained four characteristics of different patterns and structures of economic growth, namely: fast growing areas, growing areas, depressed areas, and relatively underdeveloped areas.

Unit Root Test. To find out whether the panel data used is stationary or not, one way that can be done is using the unit root test. Panel data is a combination of time series and cross-section data, so the stationary test phase also needs to be carried out. There is a difference between the stationary test in the panel data and the stationary test in the time series data, this is due to the influence of individual and time.

The basic idea of unit root test in panel data is the development of unit root test in time series, which can be explained in the model below.

$$y_{it} = \rho_t y_{it} + x_{it} \delta_{it} + \epsilon_{it} \dots\dots\dots (1)$$

Information $i = 1, 2, \dots, N$ (individuals total)
 $t = 1, 2, \dots, T$ (total of individuals period)

If it is assumed $\alpha = \rho - 1$ with lag ρ_i and varies between cross-sections, then the hypothesis test are:

$$H_0 : \alpha = 0 \text{ (has a unit root)}$$

$$H_1 : \alpha < 0 \text{ (has no unit root)}$$

If value $\rho_i = 1$ then it is said that the random variable Y has a unit root. If the panel data has a unit root, it is said that the data moves randomly (random walk) and the data has a random walk character and is said to be non-stationary. Therefore, if we perform regression Y_{it} on lag Y_{it-1} and get value $\rho_t = 1$ then the data is said to be non-stationary. This is the basic idea of unit root test to find out if the data is stationary or not. The unit root test formula based on the Augmented Dickey-Fuller (ADF) test is:

$$\Delta Y_{it} = \alpha Y_{it-1} + \sum_{f=1}^{F_i} \beta_{tf} \Delta Y_{it-f} + X_{it} \delta + \epsilon_{it} \dots\dots\dots (2)$$

If it is assumed $\alpha = \rho - 1$ with lag ρ_i and varies between cross-sections, then the hypothesis test are:

$$H_0 : \alpha = 0 \text{ (has a unit root)}$$

$$H_1 : \alpha < 0 \text{ (has no unit root)}$$

The procedure for determining whether the data is stationary or not is by comparing the statistical value with the critical value. If the absolute value of the statistic is greater than the critical value, then the observed data is stationary, and otherwise, the absolute value of the statistic is less than the critical value, then the data is not stationary.

Cointegration Test. Cointegration is a long-term relationship between variables which although individually are not stationary, but the linear combination between these variables becomes stationary. Theoretically, there are different methods in testing the cointegration of panel data. The method that can be used to perform the cointegration test is the development of the cointegration test in time-series data, such as the Pedroni and Koo method (which uses the Engle-Granger cointegration test base) and the Combined Individual Test (Fisher/Johansen).

The regression formula to perform the cointegration test is:

$$Y_{it} = \alpha_t + \delta_t + \beta_{1t} X_{1it} + \beta_{2t} X_{2it} + \dots + \beta_{Mt} X_{Mit} + \epsilon_{it} \dots\dots\dots (3)$$

Then the residual is obtained, namely:

$$\epsilon_{it} = \rho_{it} \epsilon_{it-1} + u_{it} \dots\dots\dots (4)$$

or

$$\epsilon_{it} = \rho_{it} \epsilon_{it-1} + \sum_{f=1}^{\rho_i} \varphi_{it} \Delta \epsilon_{it-1} + u_{it} \dots\dots\dots (5)$$

Based on the results of the estimated statistical value, then compared with the critical value. Statistical value is obtained from the value of ρ_t . If the statistical value is greater than the critical value, the observed variables are cointegrated or have a long-term relationship and vice versa, the observed variables are not cointegrated.

GRDP growth of provinces in Indonesia is presented in Table 1.

Based on GRDP at constant 2010 prices by province, DKI Jakarta Province has the largest GRDP compared to 34 other provinces in Indonesia for six years from 2014 to 2020. The province with the second-highest GRDP is East Java Province. The province that has had the third-largest GRDP for the last six years is West Java Province. The GRDP of West Papua

3. RESULTS AND DISCUSSION

Indonesia's Economic Growth

Gross Regional Domestic Product (GRDP) is an indicator to measure the success of the government in utilizing existing resources, and can be used for planning and decision making. The higher the GRDP of an area, the greater the potential source of regional revenue. The

Province at constant prices in 2010 was 50.3 trillion, continuing to increase every year to 61.6 trillion in 2020. The GRDP of West Papua Province at constant prices grew by 22.5% between the period 2014-2020.

In general, all provinces in Indonesia experienced economic growth based on GRDP in 2014 to 2020. The

province that has the lowest GRDP compared to 34 other provinces in Indonesia is North Maluku. For the sixth year in a row, this province has the lowest GRDP at 2010 constant prices which only ranged from 19,208 to 27,868 billion.

Table 1. [2010 Series] Gross regional domestic product (billion IDR) based on constant prices

Province	Years						
	2014	2015	2016	2017	2018	2019	2020
Aceh	113.490,36	112.665,53	116.374,30	121.240,98	126.824,37	132.074,25	131.585,02
North Sumatra	419.573,31	440.955,85	463.775,46	487.531,23	512.762,63	539.513,85	533.746,36
West Sumatra	133.340,84	140.719,47	148.134,24	155.984,36	163.996,19	172.213,79	169.458,11
Riau	447.986,78	448.991,96	458.769,34	470.983,51	482.064,63	495.598,10	490.024,47
Jambi	119.991,44	125.037,40	130.501,13	136.501,71	142.902,00	149.142,59	148.449,87
South Sumatra	243.297,77	254.044,88	266.857,40	281.571,01	298.484,07	315.474,27	315.143,01
Bengkulu	36.207,15	38.066,01	40.076,54	42.073,52	44.164,11	46.345,45	46.338,44
Lampung	189.797,49	199.536,92	209.793,73	220.626,10	232.165,99	244.380,37	240.306,86
Bangka Belitung Islands	44.159,44	45.962,30	47.848,37	49.985,15	52.208,04	53.940,42	52.702,46
Riau Islands	146.325,23	155.131,35	162.853,04	166.081,68	173.498,75	181.895,86	174.976,70
DKI Jakarta	1.373.389,13	1.454.563,85	1.539.916,88	1.635.359,15	1.735.208,29	1.836.198,49	1.792.794,59
West Java	1.149.216,06	1.207.232,34	1.275.619,24	1.343.662,14	1.419.624,14	1.491.575,95	1.455.235,14
Central Java	764.959,15	806.765,09	849.099,35	893.750,30	941.091,14	991.913,12	965.629,09
DI Jogjakarta	79.536,08	83.474,45	87.685,81	92.300,24	98.024,01	104.487,54	101.679,60
East Java	1.262.684,50	1.331.376,10	1.405.563,51	1.482.299,58	1.563.441,83	1.649.768,12	1.610.419,65
Banten	349.351,23	368.377,20	387.835,09	410.137,00	433.782,71	456.740,83	441.295,80
Bali	121.787,57	129.126,56	137.296,45	144.933,31	154.072,66	162.694,33	147.549,80
West Nusa Tenggara	73.372,96	89.337,99	94.524,29	94.608,21	90.349,13	93.869,73	93.269,13
East Nusa Tenggara	54.107,97	56.770,79	59.678,01	62.725,41	65.929,19	69.385,99	68.806,67
West Kalimantan	107.114,96	112.346,76	118.183,27	124.289,17	130.596,32	137.243,09	134.743,38
Central Kalimantan	73.724,52	78.890,97	83.900,24	89.544,90	94.566,25	100.357,57	98.956,72
South Kalimantan	106.779,40	110.863,12	115.743,57	121.858,52	128.052,58	133.271,55	130.865,60
East Kalimantan	446.029,05	440.676,36	439.003,83	452.741,91	464.694,43	486.712,24	472.864,89
North Kalimantan	47.696,35	49.315,75	51.064,74	54.537,31	57.459,31	61.422,64	60.743,20
North Sulawesi	66.360,76	70.425,33	74.764,66	79.484,03	84.249,72	89.009,26	88.126,37
Central Sulawesi	71.677,53	82.787,20	91.014,56	97.474,86	117.555,83	127.935,06	134.152,69
South Sulawesi	233.988,05	250.802,99	269.401,31	288.814,17	309.156,19	330.506,38	328.192,82
Southeast Sulawesi	68.291,78	72.993,33	77.745,51	83.001,69	88.310,05	94.053,39	93.446,72
Gorontalo	20.775,80	22.068,80	23.507,21	25.090,13	26.719,27	28.428,44	28.422,29
West Sulawesi	24.195,65	25.964,43	27.524,77	29.282,49	31.114,14	32.877,78	32.082,45
Maluku	23.567,73	24.859,20	26.284,23	27.814,05	29.457,13	31.049,43	30.765,02
North Maluku	19.208,76	20.380,30	21.556,68	23.210,86	25.034,08	26.561,31	27.868,47
West Papua	50.259,91	52.346,49	54.711,28	56.907,96	60.465,52	62.072,75	61.592,39
Papua	121.391,23	130.311,60	142.224,93	148.818,29	159.711,85	134.562,24	137.677,57
Indonesia	8.605.809,67	8.982.517,10	9.434.613,40	9.912.928,10	10.425.851,90	10.949.037,80	10.722.442,70

Provinces located on the island of Java account for the largest GRDP in Indonesia, such as East Java, West Java, and Central Java, including DKI Jakarta and DI Yogyakarta. The provincial GRDP on this island has always increased every year from 2014 to 2020. On the other hand, provinces in eastern Indonesia such as North Maluku, Maluku, Gorontalo, and West Sulawesi have always been in the lowest position in terms of GRDP at constant prices during the period. that time. The province of NTT, which used to have low competitiveness compared to other provinces in Indonesia, has now grown and developed far from the provinces of Maluku and North Maluku, which used to have higher GRDP. Economic growth through GRDP from NTT Province is allegedly due to being able to improve and increase the backwardness of the region, improve and improve production performance, develop technological infrastructure and the level of competition,

conductive legal standards, and law enforcement. Areas with low GRDP growth may not be able to improve production performance and the unavailability of technology infrastructure has also led to a decline in foreign investor interest which has an impact on low economic growth which in turn leads to low government tax revenues.

Thus, when examined from the growth of the GRDP of provinces throughout Indonesia at constant prices in 2010, it can be concluded that there is a continuous increase in the GRDP of each province, some increasing significantly and some increasing slowly. Nevertheless, the GRDP of provinces in Indonesia in 2020 decreased significantly. This may be influenced by the global situation in the form of the Covid-19 pandemic which destroyed the world economy, including Indonesia. The development of GRDP growth of provinces in Indonesia from 2014 to 2020 can be seen in Figure 1.

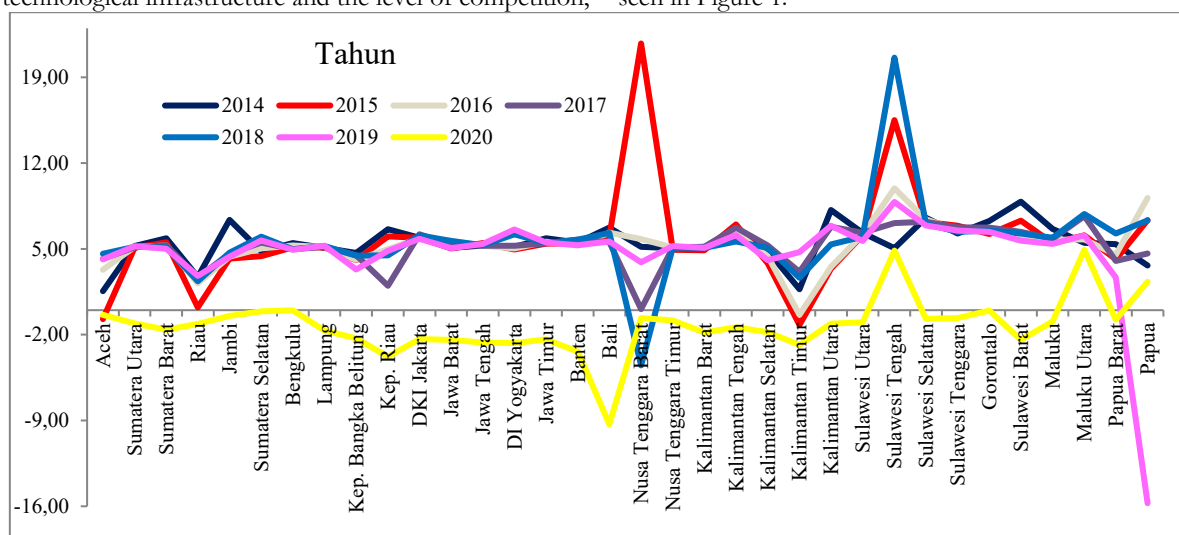


Figure 1. Development of GRDP growth of provinces in Indonesia (data processed, 2021)

Based on the data in Figure 1 shows that in 2014 the highest and most significant GRDP growth development was in the provinces in eastern Indonesia such as West Sulawesi (8.86%) and followed by North Kalimantan (8.18%), while in western Indonesia are Jambi (7.36%) and Riau Islands (6.60%). In 2015, the provinces in Indonesia that experienced the highest GRDP growth were West Nusa Tenggara (21.76%) and Central Sulawesi (15.50%), but several other provinces experienced a significant decline, such as Aceh (-0.37%), Riau (0.22%), and East Kalimantan (-0.38%). In 2016-2018, the development of GRDP growth in provinces in Indonesia was quite slow and flat, with the exception of Papua Province which decreased significantly to minus 15.75% from 2018 to 2019. In 2020, almost all provinces in Indonesia experienced a significant decline in GRDP up to minus level caused by the global Covid-19 pandemic which has created a decline in work

participation rates and increased unemployment, closed production facilities and technology, and went bankrupt and laid off millions of people who are working and of productive age. Nevertheless, the two provinces that we're able to increase GRDP growth when other provinces experienced a decline in GRDP were Central Sulawesi (4.86%) and North Maluku (4.92%) and Papua (2.32%). North Maluku Province, which had the lowest GRDP growth during the 2014-2019 period, was able to grow during the Covid-19 pandemic. Likewise, Papua Province from 2018-2019 has a value of -15.75% in GRDP growth, able to increase GRDP in 2020 by 2.32%. In general, Indonesia's GRDP continues to grow and develop from 2010-2019 as shown in Figure 2. Indonesia's GRDP in 2020 decreased due to the Covid-19 pandemic situation and the decline in the graph of GRDP growth in provinces throughout Indonesia.

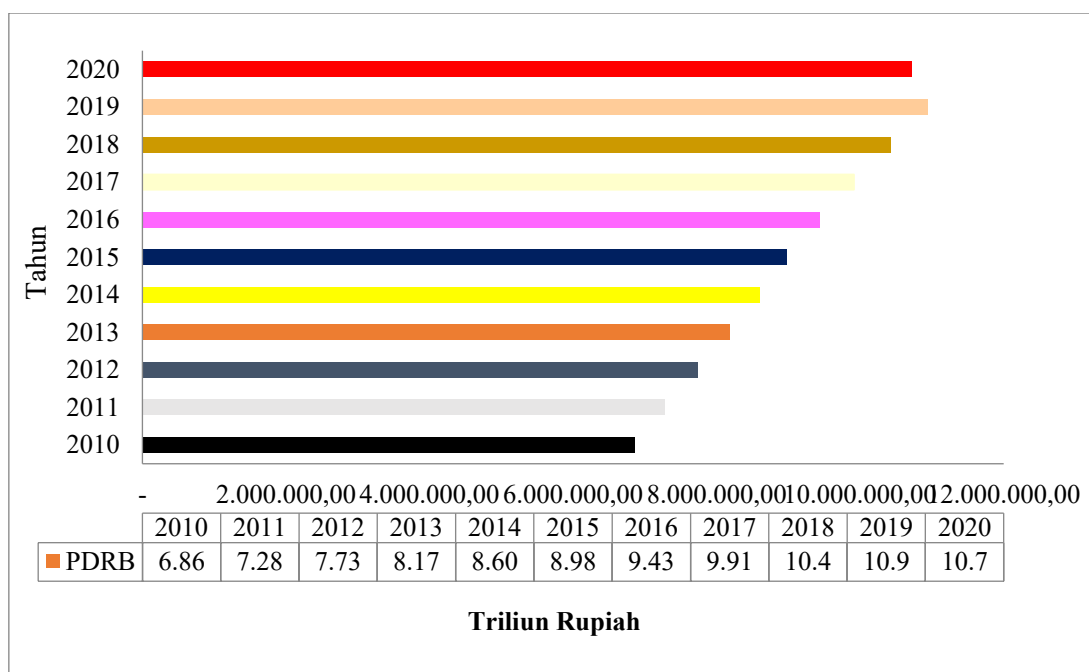


Figure 2. Indonesia's GDP Growth Period 2010-2020

Based on the description of GRDP growth and the development of GRDP growth from all provincial GRDP in Indonesia at constant 2010 prices, it can be concluded that sometimes the GRDP has increased and sometimes the GRDP of each province in Indonesia has decreased. The GRDP is influenced by several things, including the wealth in the form of economic resources (natural wealth), population, and the ability of the population (HR) in applying production techniques or processing the wealth owned by the region. The tendency of the distribution of GRDP control and the uneven growth rate will lead to more unequal development between regions.

The 2010 Human Development Report released by UNDP shows that Indonesia's Human Development Index (HDI) is ranked 108 out of 169 countries recorded. HDI is a composite index that includes health quality, education level, and economic condition (income). When compared to ASEAN countries, Indonesia is only ranked 6th out of 10 countries. This ranking is still lower than Singapore (27), Brunei Darussalam (37), Malaysia (57), Thailand (92), and the Philippines (97). The HDI rankings of Indonesia and other countries in the world are presented in Table 2. Furthermore, the development of the Human Development Index of provinces throughout Indonesia can be seen in Table 3.

The Development of Indonesia's Human Development Index

Table 2. Indonesia's HDI ranking against other countries in the world

Negara	Peringkat IPM (Tahun)			
	2010	2011	2012	2013
Amerika Serikat/USA	4	5	5	5
Arab Saudi/Saudi Arabia	43	38	34	34
Australia	2	2	2	2
Bangladesh	143	141	143	142
Belanda/Netherlands	5	3	4	4
Belgia/Belgium	22	22	21	21
Brazil	77	78	80	79
Denmark	9	10	10	10
Federasi Rusia/Russian Federation	59	57	57	57
Filipina/Philippines	117	118	118	117
Finlandia/Finland	20	23	24	24
Hongkong/Hongkong SAR	16	17	15	15
India	136	135	135	135
Indonesia	108	109	109	108

Negara	Peringkat IPM (Tahun)			
Inggris/United Kingdom	11	13	14	14
Italia/Italy	26	26	26	26
Jepang/Japan	15	15	16	17
Jerman/Germany	5	6	6	6
Kamboja/Cambodia	135	137	137	136
Kanada/Canada	10	8	8	8
Kazakhstan	71	71	70	70
Korea Selatan	16	17	16	15
Kuwait	47	47	44	46
Malaysia	62	61	62	62
Meksiko/Mexico	70	69	70	71
Mesir/Egypt	106	107	108	110
Myanmar	149	150	150	150
Nigeria	153	153	153	152
Norwegia/Norway	1	1	1	1
Pakistan	147	146	146	146
Perancis/France	21	20	20	20
Singapura/Singapore	13	11	11	9
Sri Lanka	79	78	75	73
Swedia/Sweden	11	11	12	12
Swiss/Switzerland	3	3	3	3
Thailand	91	91	89	89
Tiongkok/China	98	97	93	91
Venezuela	65	64	66	67
Vietnam	121	121	121	121

Table 3. HDI developments of provinces in Indonesia in 2014-2020

Provinces	Years						
	2014	2015	2016	2017	2018	2019	2020
Aceh	68,81	69,45	70,00	70,60	71,19	71,90	71,99
North Sumatra	68,87	69,51	70,00	70,57	71,18	71,74	71,77
West Sumatra	69,36	69,98	70,73	71,24	71,73	72,39	72,38
Riau	70,33	70,84	71,20	71,79	72,44	73,00	72,71
Jambi	68,24	68,89	69,62	69,99	70,65	71,26	71,29
South Sumatra	66,75	67,46	68,24	68,86	69,39	70,02	70,01
Bengkulu	68,06	68,59	69,33	69,95	70,64	71,21	71,40
Lampung	66,42	66,95	67,65	68,25	69,02	69,57	69,69
Bangka Belitung Islands	68,27	69,05	69,55	69,99	70,67	71,30	71,47
Riau Islands	73,40	73,75	73,99	74,45	74,84	75,48	75,59
DKI Jakarta	78,39	78,99	79,60	80,06	80,47	80,76	80,77
West Java	68,80	69,50	70,05	70,69	71,30	72,03	72,09
Central Java	68,78	69,49	69,98	70,52	71,12	71,73	71,87
DI Jogjakarta	76,81	77,59	78,38	78,89	79,53	79,99	79,97
East Java	68,14	68,95	69,74	70,27	70,77	71,50	71,71
Banten	69,89	70,27	70,96	71,42	71,95	72,44	72,45
Bali	72,48	73,27	73,65	74,30	74,77	75,38	75,50
West Nusa Tenggara	64,31	65,19	65,81	66,58	67,30	68,14	68,25

Provinces	Years						
	2014	2015	2016	2017	2018	2019	2020
East Nusa Tenggara	62,26	62,67	63,13	63,73	64,39	65,23	65,19
West Kalimantan	64,89	65,59	65,88	66,26	66,98	67,65	67,66
Central Kalimantan	67,77	68,53	69,13	69,79	70,42	70,91	71,05
South Kalimantan	67,63	68,38	69,05	69,65	70,17	70,72	70,91
East Kalimantan	73,82	74,17	74,59	75,12	75,83	76,61	76,24
North Kalimantan	68,64	68,76	69,20	69,84	70,56	71,15	70,63
North Sulawesi	69,96	70,39	71,05	71,66	72,20	72,99	72,93
Central Sulawesi	66,43	66,76	67,47	68,11	68,88	69,50	69,55
South Sulawesi	68,49	69,15	69,76	70,34	70,90	71,66	71,93
Southeast Sulawesi	68,07	68,75	69,31	69,86	70,61	71,20	71,45
Gorontalo	65,17	65,86	66,29	67,01	67,71	68,49	68,68
West Sulawesi	62,24	62,96	63,60	64,30	65,10	65,73	66,11
Maluku	66,74	67,05	67,60	68,19	68,87	69,45	69,49
North Maluku	65,18	65,91	66,63	67,20	67,76	68,70	68,49
West Papua	61,28	61,73	62,21	62,99	63,74	64,70	65,09
Papua	56,75	57,25	58,05	59,09	60,06	60,84	60,44
Indonesia	68,90	69,55	70,18	70,81	71,39	71,92	71,94

The HDI of provinces throughout Indonesia continued to increase from 2014 to 2020. The HDI of provinces in Eastern Indonesia was generally still below the national average. Lampung HDI is ranked 24 out of 34 provinces, or continues to increase compared to 2014 which was ranked 26 out of 34 provinces in Indonesia. During the 2014-2020 period, DKI Jakarta always occupies the highest position or rank with an HDI which is always above 78.39 and is followed by DI Yogyakarta and East Kalimantan (Table 4).

Table 4. HDI ranking of provinces in Indonesia in 2014-2020

Provinces	Years						
	2014	2015	2016	2017	2018	2019	2020
Aceh	11	11	11	11	11	11	11
North Sumatra	10	12	12	12	12	12	14
West Sumatra	9	9	9	9	9	9	9
Riau	6	6	6	6	6	6	7
Jambi	17	17	17	16	17	17	19
South Sumatra	23	23	23	23	23	23	23
Bengkulu	20	18	18	18	18	18	18
Lampung	26	24	24	24	24	24	24
Bangka Belitung Islands	16	16	16	16	16	16	16
Riau Islands	4	4	4	4	4	4	4
DKI Jakarta	1	1	1	1	1	1	1
West Java	12	10	10	10	10	10	10
Central Java	13	13	13	13	13	13	13
DI Jogjakarta	2	2	2	2	2	2	2
East Java	18	15	15	15	15	15	15
Banten	8	8	8	8	8	8	8
Bali	5	5	5	5	5	5	5
West Nusa Tenggara	30	29	29	29	29	29	29
East Nusa Tenggara	31	32	32	32	32	32	32
West Kalimantan	29	30	30	30	30	30	30
Central Kalimantan	21	21	21	21	21	21	20

Provinces	Years						
	2014	2015	2016	2017	2018	2019	2020
South Kalimantan	22	22	22	22	22	22	21
East Kalimantan	3	3	3	3	3	3	3
North Kalimantan	14	20	20	20	20	20	22
North Sulawesi	7	7	7	7	7	7	6
Central Sulawesi	25	25	25	26	25	25	25
South Sulawesi	15	14	14	14	14	14	12
Southeast Sulawesi	19	19	19	19	19	19	17
Gorontalo	28	28	28	28	28	28	27
West Sulawesi	32	31	31	31	31	31	31
Maluku	24	26	26	25	26	26	26
North Maluku	27	27	27	27	27	27	28
West Papua	33	33	33	33	33	33	33
Papua	34	34	34	34	34	34	34

The lowest HDI ranking among the provinces in Indonesia is occupied by the Provinces of West Papua and Papua. North Kalimantan Province continues to decline its HDI development wherein 2014 it was ranked 14th but in 2020 it decreased to rank 20. The development of the HDI of West Java Province in the 2014-2020 period is getting better, the HDI of West Java Province in 2014 reached 68.80 still low compared to the national HDI average (68.90), but in 2020, West Java Province HDI (72.09) is above the national HDI average (71.94) and is ranked 10th in the national HDI after the Province of West Sumatra. In 2020, the highest

provincial HDI ranking is DKI Jakarta (80.77) then followed by the second DI Yogyakarta 79.97, the third East Kalimantan 76.24, then Riau Islands 75.59, and so on to 32 East Nusa Tenggara. 65.19, the 33rd is West Papua 65.09 and the very lowest is the 34th is Papua 60.44. The existence of a different wave of fluctuations from one province to another is a result of the different successes in efforts to improve or increase the HDI components that differ between provinces. Nevertheless, the development of Indonesia's HDI continues to improve, as can be seen in Figure 3.

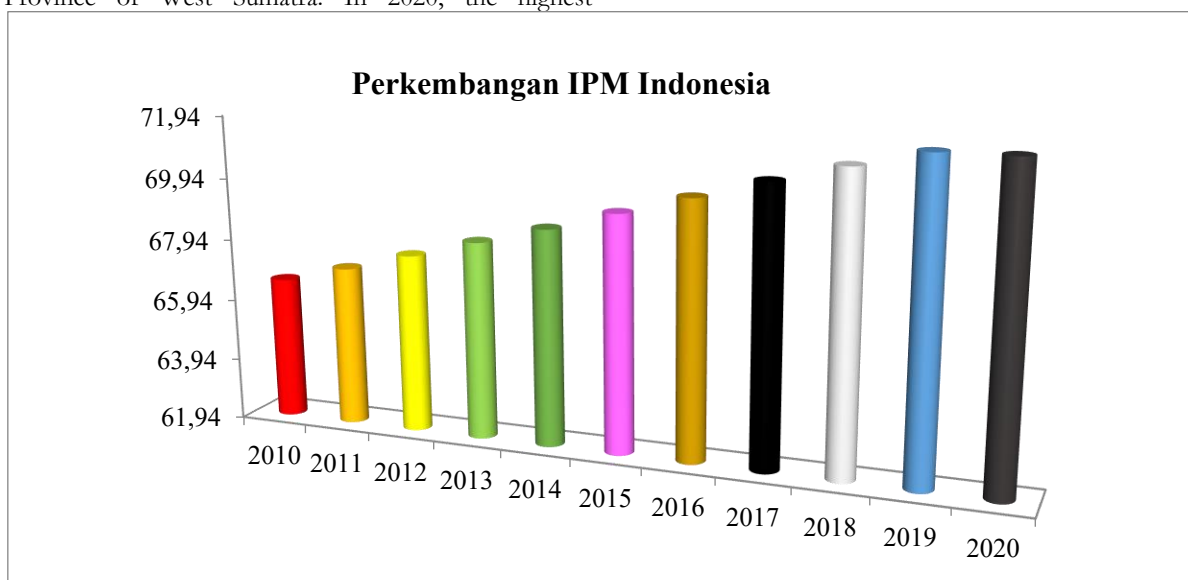


Figure 3. Development of Indonesia's HDI for the period 2010-2020

Figure 3 shows that there has been an increase in HDI in Indonesia every year. The development of the HDI shows an increase in the achievement of the HDI in line with the improvement in the country's economy since 2010-2019. Although since 2019-2020 the world and Indonesia have been hit by the global Covid-19 pandemic, Indonesia's HDI has continued to increase despite an increase of 0.03%. The development of the HDI shows an increase in the achievement of the HDI

in line with the improvement in the country's economy. So it can be concluded that an increase in HDI in Indonesia will have an impact on improving the economy of a country. Currently, the HDI condition in Indonesia tends to increase, the value of the achievements that have been achieved by Indonesia in increasing the HDI at the end of 2020 is 71.74. During the 2015-2019 period, the HDI condition in Indonesia tends to increase by 0.6% annually. This occurs due to a

change in one or more components or a decrease in HDI in that period. The change in question can be an increase or decrease in the amount of the HDI component, namely life expectancy, literacy rate, and per capita income of a society.

Regional Classification Based on Klassen Typological Analysis

Klassen typology analysis is used to classify the provinces in Indonesia into four characteristics of economic growth. Data on the classification of provinces throughout Indonesia based on the Klassen typology is presented in Table 5.

Table 5. Classification based on Klassen Typology

No.	Provinces	Economy Growth		Human Development Index		Klassen Typology	
		r	ri	y	yi	Information	Quadrant
1	Aceh	2,38	1,23	0,75	2,98	Depressed Area	III
2	North Sumatra	4,28	4,88	0,70	2,98	Fast Developing Area	II
3	West Sumatra	4,36	1,56	0,70	3,00	Depressed Area	III
4	Riau	1,69	4,76	0,56	3,03	Area of Fast Forward and Fast Developing	I
5	Jambi	4,16	1,37	0,73	2,95	Depressed Area	III
6	South Sumatra	4,48	2,84	0,81	2,90	Depressed Area	III
7	Bengkulu	4,40	0,42	0,81	2,95	Depressed Area	III
8	Lampung	4,19	2,21	0,84	2,88	Depressed Area	III
9	Bangka Belitung Islands	3,26	0,50	0,73	2,96	Depressed Area	III
10	Riau Islands	3,58	1,67	0,50	3,14	Depressed Area	III
11	DKI Jakarta	4,78	16,32	0,49	3,37	Area of Fast Forward and Fast Developing	I
12	West Java	4,20	13,42	0,79	2,98	Area of Fast Forward and Fast Developing	I
13	Central Java	4,18	8,93	0,79	2,97	Area of Fast Forward and Fast Developing	I
14	DI Jogjakarta	4,36	0,93	0,65	3,32	Depressed Area	III
15	East Java	4,42	14,81	0,86	2,96	Area of Fast Forward and Fast Developing	I
16	Banten	4,24	4,09	0,60	3,01	Depressed Area	III
17	Bali	3,89	1,43	0,66	3,13	Depressed Area	III
18	West Nusa Tenggara	4,51	0,91	0,98	2,81	Depressed Area	III
19	East Nusa Tenggara	4,25	0,63	0,79	2,69	Depressed Area	III
20	West Kalimantan	4,09	1,24	0,73	2,80	Depressed Area	III
21	Central Kalimantan	5,23	0,89	0,75	2,94	Depressed Area	III
22	South Kalimantan	3,67	1,22	0,78	2,93	Depressed Area	III
23	East Kalimantan	1,11	4,63	0,58	3,17	Area of Fast Forward and Fast Developing	I
24	North Kalimantan	4,72	0,55	0,55	2,95	Depressed Area	III
25	North Sulawesi	5,08	0,79	0,69	3,02	Depressed Area	III
26	Central Sulawesi	10,27	1,03	0,80	2,87	Depressed Area	III
27	South Sulawesi	6,08	2,88	0,82	2,97	Depressed Area	III
28	Southeast Sulawesi	5,52	0,83	0,81	2,95	Depressed Area	III
29	Gorontalo	5,66	0,25	0,86	2,83	Depressed Area	III

No.	Provinces	Economy Growth		Human Development Index		Klassen Typology	
		r	ri	y	yi	Information	Quadrant
30	West Sulawesi	5,44	0,29	1,03	2,71	Depressed Area	III
31	Maluku	4,87	0,28	0,72	2,88	Depressed Area	III
32	North Maluku	6,27	0,23	0,80	2,83	Depressed Area	III
33	West Papua	3,74	0,57	0,95	2,66	Depressed Area	III
34	Papua	2,67	1,41	1,03	2,49	Depressed Area	III

Based on the data in Table 5, it can be classified the provinces in Indonesia according to the Klassen typology, namely:

1. Provinces are classified as fast-growing and fast-growing regions (quadrant I), namely Riau, DKI Jakarta, West Java, Central Java, East Java, and East Kalimantan. This province is classified as fast-growing and fast-growing because it has economic growth and a human development index that is above the national average.
2. The province classified as a fast developing area (quadrant II) is North Sumatra Province because it has a regional economic growth rate that is higher than the national economic growth rate but the HDI is lower than the national one.
3. Provinces classified as developed but depressed regions (quadrant III) are Aceh, West Sumatra, Jambi, South Sumatra, Bengkulu, Lampung, Bangka Belitung Islands, Riau Islands, DI Yogyakarta, Banten, Bali, West Nusa Tenggara, Nusa Tenggara East, West Kalimantan, Central Kalimantan, South Kalimantan, North Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, Gorontalo, West Sulawesi, Maluku, North Maluku, West Papua and Papua. This region is classified in quadrant III because it has a regional economic growth rate and the national economic

growth rate fluctuates from high to low or from low to high, along with the HDI growth rate which is fairly constant or fixed.

4. Provinces classified as relatively underdeveloped regions (quadrant IV) no longer exist in Indonesia. This explains that economic growth in Indonesia is developing well, including the growth rate of Indonesia's HDI which is relatively constant. The existence of a fairly even development in Indonesia by opening access to the economy, transportation, price stability, conducive security, an investment that supports the business sector, and others encourages the pace of economic growth and the development of HDI in Indonesia is developing well from year to year.

Unit Root Test Results

The determination of whether the analyzed data is stationary or not is by comparing the statistical value with the critical value. If the absolute value of the statistic is greater than the critical value, then the analyzed data shows stationary data and otherwise, if the absolute value of the statistic is less than the critical value, then the data is not stationary. The results of the unit root test in this study are presented in Table 6 and Table 7.

Table 6. Unit root test results for economic growth variables

Method	Statistic	Prob.*
ADF – Fisher Chi-Square	868.343	0.0014
ADF – Choi Z-stat	-7.015970	0.0130

Sumber: Hasil pengolahan data

Table 7. The results of the unit root test of the Human Development Index (HDI) variable

Method	Statistic	Prob.*
ADF – Fisher Chi-Square	73.9942	0.0245
ADF – Choi Z-stat	-4.54193	0.0043

Sumber: Hasil pengolahan data

Based on the results of the stationarity test in Table 6 and Table 7, it is shown that the economic growth variable has a coefficient of 868,343 with a probability less than 0.05, so the null hypothesis which states that the data is not stationary is rejected. Likewise, the human development index variable has a coefficient of 73.9942 and a probability which is also smaller than 0.05 so that the null hypothesis is also rejected, so that the HDI variable is stationary or in other words, does not have a unit root value.

The two variables tested were stationary, namely the variable economic growth and the human development index which were stationary at different

degrees of integration. The variable economic growth is stationary at the first degree of integration I(1) while the human development index variable is stationary at the second degree of integration I(2).

Cointegration Test Results

The results of the cointegration panel test with a non-parametric approach (Table 8) show that the v-statistics panel has a coefficient of -0.307648 while the rho-statistics panel has a cointegration coefficient of -0.5535. Furthermore, the cointegration coefficient using the PP-Statistic Panel is -5.4595 and the ADF-Statistic Panel coefficient is -3.2070. The probability of each test method shows that the variables used are cointegrated at

a significance level of 0.05 except for the test with the v- Statistics Panel and the rho-Statistics Panel.

Table 8. Cointegration test results between economic growth and HDI

Alternative hypothesis: common AR coefs. (within-dimension)				
Weighted	Statistic	Prob	Statistic	Prob
Panel v-Statistic	-0.307648	0.6490	-0.530331	0.7012
Panel rho-Statistic	-0.553595	0.2839	-0.183309	0.4227
Panel PP-Statistic	-5.459528	0.0000	-3.932601	0.0000
Panel ADF-Statistic	-3.207071	0.0004	-2.403975	0.0083

Alternative hypothesis: individual AR coefs. (within-dimension)

	Statistic	Prob
Group rho-Statistic	0.500450	0.6971
Group PP-Statistic	-4.411514	0.0000
Group ADF-Statistic	-2.530912	0.0026

The result of the cointegration panel test using the parametric approach shows that Group rho-Statistic has a coefficient of 0.500450 while Group PP-Statistic has a cointegration coefficient of -4.411514. Furthermore, the cointegration coefficient using Group ADF-Statistic is -2.530912. The probability of each test method shows that the variables used are cointegrated at a significance level of 5% except for testing with Group rho-Statistics. Thus, it can be concluded that four panels out of a total of seven test panels show that economic growth and HDI are cointegrated, that is, they have long-term equilibrium or have the same direction of movement. This is because, in each short-run period, all variables tend to adjust to each other to reach their long-run equilibrium.

Further research using a system dynamics approach is needed to predict the levels of economic growth and the Human Development Index based on their respective influencing predictors.

ACKNOWLEDGEMENT

Special thanks to Dr. Fellyanus Haba Ora, S.Pt., M.Si., MM, for his assistance in formulating the article title and identifying journal sources to refine the results of this research.

REFERENCES

4. CONCLUSION

Based on the results of the data analysis conducted, it can be concluded that in general the variable economic growth of the provinces in Indonesia during the period 2014-2020 has increased every year with the highest average growth rate being DKI Jakarta Province and the lowest being North Maluku Province. The HDI condition of the provinces in Indonesia tends to increase every year with the highest HDI ranking being DKI Jakarta Province and the lowest being Papua Province. Klassen typology analysis shows that the provinces in Indonesia are no longer classified as relatively underdeveloped regions (quadrant IV) but most of them are in the developed but depressed category (quadrant III). Based on the results of the cointegration test, it shows that there is a long-term balance relationship between economic growth and the human development index of the provinces in Indonesia. Economic growth policies through the development of the human development index need to be improved by the Government of Indonesia to spur Indonesia's economic growth through indispensable components of the HDI, such as boosting the productivity of the Indonesian population, equitable access to development, sustainable national development, and empowering the population through the national creative economy.

5. SUGGESTION

- Asnidar, A. (2018). Pengaruh Indeks Pembangunan Manusia (IPM) dan inflasi terhadap pertumbuhan ekonomi di Kabupaten Aceh Timur. *Jurnal Samudra Ekonomika*, 2(1), 1-12.
- Firmansyah, N. J. (2017). Sistem Pakar Identifikasi Pengecekan Kualitas Kopi Berbasis Web Dengan Menggunakan Metode Certainty Factor. *Jurnal Rekursif*, 298-306.
- Hartati, S. d. (2013). *Sistem Pakar dan Pengembangannya*. Yogyakarta: Graha Ilmu.
- Indrawati, Y. H. (2011). Simulasi Pergerakan Langkah Kuda Menggunakan Metode Breadth First Search. *Media Informatika*, 1-7.
- Lilya Santika Dewi, N., & Sutrisna, I. (2014). Pengaruh komponen indeks pembangunan manusia terhadap pertumbuhan ekonomi Provinsi Bali. *E-jurnal Ekonomi Pembangunan Universitas Udayana*, 3(3), 106-114.
- Lumbantoruan, E. P., & Hidayat, P. (2014). Analisis pertumbuhan ekonomi dan indeks pembangunan manusia (IPM) provinsi-provinsi di Indonesia (metode Kointegrasi). *Jurnal Ekonomi dan Keuangan*, 2(2), 14-27.
- Monteiro, R. L., Pereira, V., & Costa, H. G. (2018). A multicriteria approach to the Human Development Index classification. *Social Indicators Research: An International and*

- Interdisciplinary Journal for Quality-of-Life Measurement, Springer, 136(2), 417-438.*
- Perkebunan, D. P. (2002). *Musuh Alami, Hama, dan Penyakit Tanaman Kopi*. Jakarta: Departemen Pertanian.
- Peterson, E. W. (2017). The role of population in economic growth. *Sage Journals, 7(4), 1-15.*
- Rita, H. d. (2015). *Teknologi Pengendalian Hama dan Penyakit Tanaman Kopi*. Jakarta: IAARD.
- Saleh, H., Surya, B., Ahmad, D. N., & Manda, D. (2020). The role of natural and human resources on economic growth and regional development: With discussion of open innovation dynamics. *Journal of Open Innovation: Technology, Market, and Complexity, 6(4), 1-24.*
- Siregar, D. R., & Tanjung, A. A. (2020). Pengaruh infrastruktur dan indeks pembangunan manusia terhadap pertumbuhan ekonomi Kabupaten Langkat 2010-2019. *Jurnal Ekonomi Bisnis, 19(2), 173-180.*
- Sutojo, T. M. (2011). *Kecerdasan Buatan*. Yogyakarta: Andi.
- Turban, E. (2005). *Decision Suport System and Inteligence System*. Yogyakarta: Andi.
- Wardhana, I. W. (2016). Political economic determinants of growth acceleration: A Korea-Indonesia comparative study. *Kajian Ekonomi Keuangan, 20(1), 77-95.*
- Zai, D. B. (2016). Simulasi Rute Terpendek Lokasi Pariwisata Dengan Menggunakan Metode Breadth First Search dan Tabu Search. *Jurnal InFact, 30-41.*