International Journal of Business and Administrative Studies
volume 6 issue 2 pp. 97-110 doi: https://dx.doi.org/10.20469/ijbas.6.10004-2

Unequal Economic Growth Between Regions in Indonesia: Hard Infrastructure or Soft Infrastructure?

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Abstract: Infrastructure is one of the inputs that could affect the growth of a region. The difference in infrastructure development between regions is an obstacle for Indonesia in the rise of economic growth, directly proportional to the increase of inequality between regions. This study aims to determine the effect of infrastructure development carried out by the Government of Indonesia. In this study, infrastructure is divided into 2: hard infrastructures, where there are electrification variables, access to water and road access, and soft infrastructure, explained through variables of life expectancy, literacy rates, and school enrolment rates. This study is conducted using the Ordinary Least Square analysis techniques to explain the growth-inequality between regions using the Williamson Index. Principal Component Analysis (PCA) is applied in this study to define hard infrastructure variables and soft infrastructure. This study shows that the development of hard infrastructure and soft infrastructure in various regions in Indonesia has reduced inequality in various regions in Indonesia. This research is expected to provide information on the influence of hard infrastructure and soft infrastructure development on the imbalance of economic growth between regions in Indonesia

Keywords: *Inequality, hard infrastructure, soft infrastructure, economic growth*

Received: 04 November 2019; ***Accepted:*** 25 January 2020; ***Published:*** 20 April 2020

INTRODUCTION

Economic growth is one of the indicators used to measure the economic performance of a country. A country with low economic growth will face difficulties in increasing the society standard of living. Aside from being one indicator of economic performance, economic growth is also a measure of the level of welfare of a country. But the occurring economic growth of a country is not always followed by the creation of justice and equal distribution of people's welfare, especially in a developing country (Acquah & Ibrahim, 2020; Guru & Yadav, 2019). Simon Kuznets argues that by using Kuznets Curve Hypothesis, reveals that economic growth in the early stages of a country will increase

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inequality or income inequality and in the following period income inequality will decrease in line with increasing economic growth.

Inequality often occurs due to differences in livelihoods between societies. The poor tend to be in villages where agriculture is the main livelihood sector, in comparison to the people in cities industrial or service serves as the main sectors. Based on Chotia and Rao (2017), the occurring imbalance does not only occur between cities and villages but also an imbalance between regions. In Indonesia, regional inequality occurs strongly between the western region of Indonesia and the eastern region of Indonesia. This occurring condition is a consequence of development that is concentrated in select regions (Alexiou, Vogiazas, & Nellis, 2018; Chotia & Rao, 2017; Radya & Budi, 2019). Until now, the development carried out by the Government of Indonesia is still focused on the region of Java, although under President Joko Widodo's policy, several attempts have been made to build new economic points in various regions in Indonesia through the development of infrastructure supporting economic activities.

In Indonesia itself, the occurring inequality between regions always experiences a decrease from the previous years based on the Williamson Index on Figure 1. From the year 2013, The Williamson Index of Indonesia was in the position of 0.0695 and continued to decline in 2016 to 0.0647. This indicates a decrease in inequality that has been successfully conducted by the Indonesian Government through multiple programs, with infrastructure development being one.

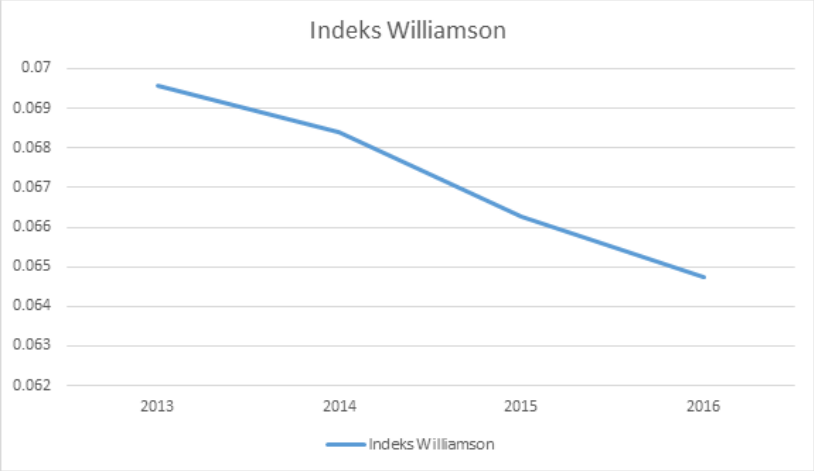

Figure 1 *Williamson Index of Indonesia (2013-2016) (Source: Badan Pusat Statistik (BPS) Indonesia)*

It is evidenced in Figure 2 where road length in Indonesia always experiences a great yearly increase despite an increase in 2015. Commencing in the year 2013 with a length of 99.351,4 kilometers and continued to increase to 104.013,8 in 2016. The road is a land infrastructure that supports goods and service transport from one region to another. When an area has enough access, the flow of goods and services will run smoothly and the economic growth of the region will expand. This is expected to reduce inequality between regions that already have good road access and new areas that have sufficient road access.

Figure 2 *Road Length in Indonesia (2013-2016) (Source: Buku Informasi Statistik Indonesia)*

Decreasing inequality due to infrastructure development in Indonesia is also evidenced by the increasing number of people who have access to electricity. Figure 3 shows that from 2013 to 2016, the number of people who have access to electricity has continued to increase from 75.75% in 2013 to 85.8% of the population in Indonesia have access to electricity in 2016. Electricity is one of the fundamental needs of every community both to increase production capacity while carrying out the production process and increasing community productivity.

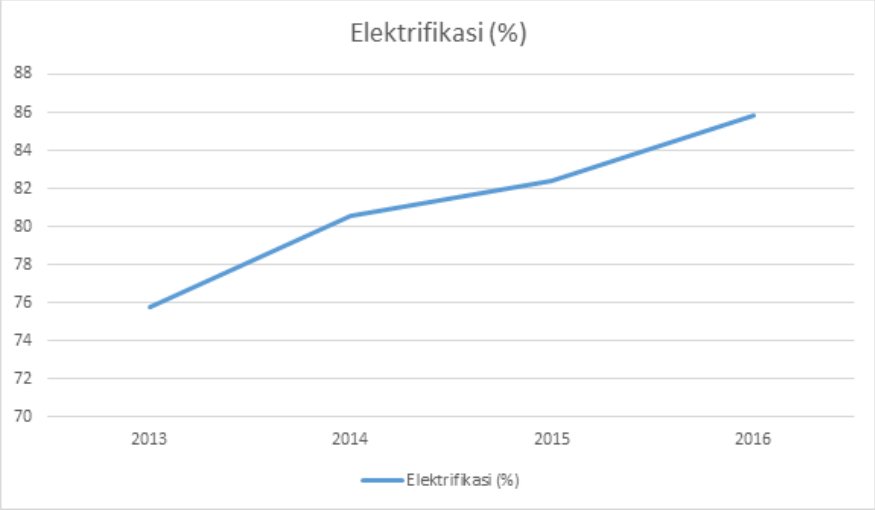

Figure 3 *Electrification Level in Indonesia (2013-2016) (Source: Statistik Ketenagalistrikan Indonesia)*

Another basic infrastructure that was built to increase regional economic growth in Indonesia and reduce the number of inequality between regions in Indonesia is the construction of irrigation channels. Irrigation channels are one of the infrastructures to support people's food needs. Indonesia as a country with an uncertain weather climate can affect food production. Irrigation channels are intended to prevent crop failures and prevent the decline in food production in Indonesia which can have an impact on economic growth in Indonesia. Based on Figure 4 irrigation channels in Indonesia have always increased from 660,711 irrigation channels in 2013 to 1,827,296 irrigation channels in 2016. Obviously with the construction of irrigation channels, especially in rural areas will help reduce the number of inequalities that occur between regions.

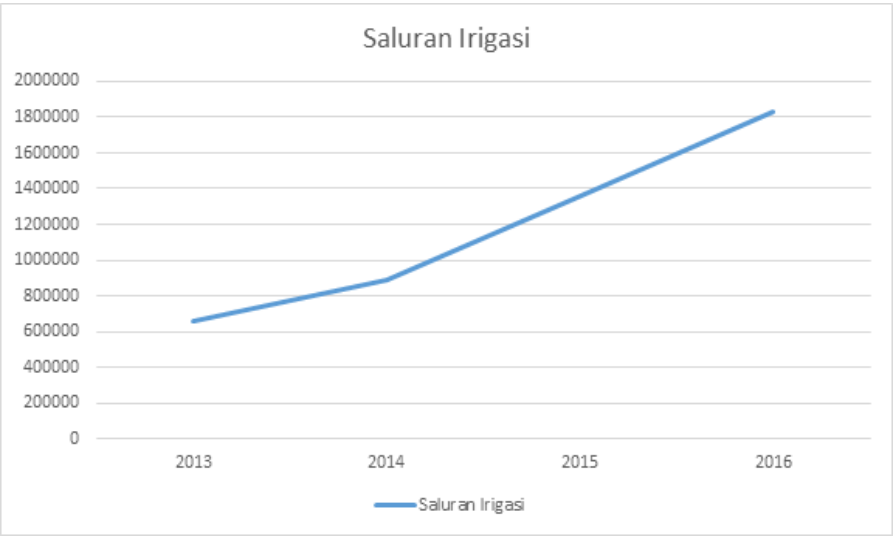

Figure 4 *Number of Irrigation Channels in Indonesia (2013-2016) (Source: Buku Informasi Statistik Indonesia)*

Basic infrastructure included in the soft infrastructure of this research uses several variables forming the Human Development Index (HDI), looking at the life expectancy of the Indonesian population in the field of public health. According to the Figure 5, the life expectancy in Indonesia continues to increase from 2013 to 2016 life expectancy in

Indonesia is almost 71 years old, the increasing life expectancy will explain that infrastructure development will reduce inequality in Indonesia.

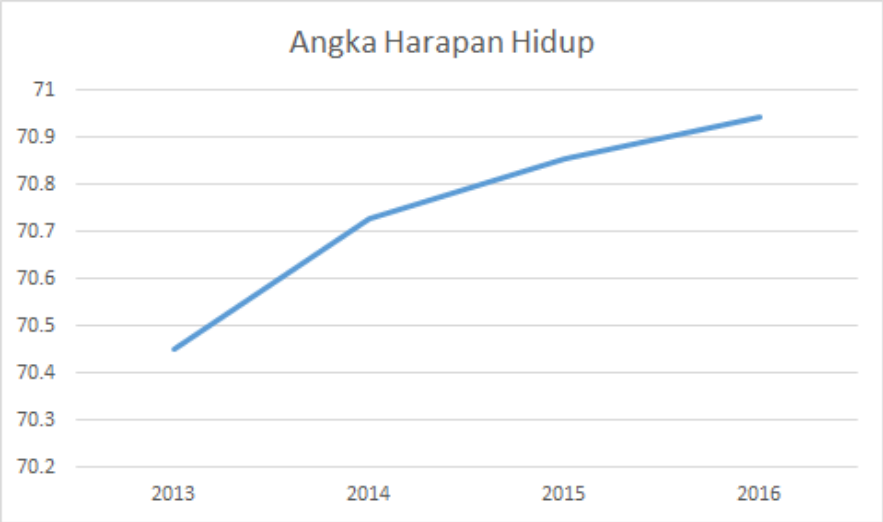

Figure 5 *Life Expectancy in Indonesia (2013-2016) (Source: Badan Pusat Statistik (BPS) Indonesia)*

Improved education infrastructure can be seen from school enrollment rates. According to the Figure 6, the level of school participation ages 16-24 continues to increase. The level of education can be one of the factors in reducing inequality, according to Nuraini (2017). In addition, the level of education of the community can be seen from the literacy rate of the inhabitants. The following is a graph of literacy rates in Indonesia.

Figure 6 *School Paricipation Rates Aged 16-24 Years in Indonesia (2013-2016) (Source: Badan Pusat Statistik (BPS) Indonesia)*

In the Figure 7, it can be seen that the literacy rate in Indonesia has increased every year. The increase in literacy rates is a result of improving educational infrastructure in each region in Indonesia which has led to an increase in community productivity.

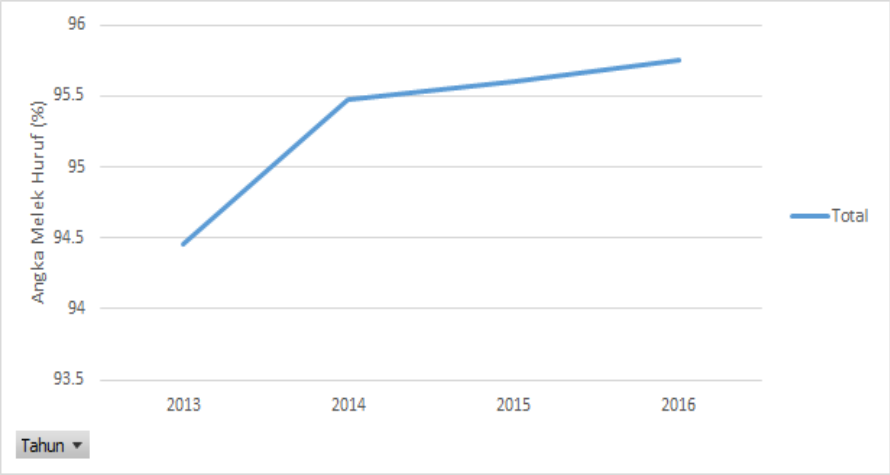

Figure 7 *Literacy Rates Aged 15 Years and Over in Indonesia (2013-2016) (Source: Badan Pusat Statistik (BPS) Indonesia)*

Several previous studies mentioned several factors that led to inequality in economic growth, one of which was the difference in inter-regional infrastructure development. As research conducted by Sukwika (2018), which explains the role of infrastructure development on economic inequality between regions in Indonesia. The results of the study conducted show that the infrastructure gap in the length of the road and the number of clean water customers tend to be followed by economic disparities (Per capita GRDP). In addition, research conducted by Chotia and Rao (2017) shows that the role of infrastructures such as road access, clean water, and sanitation is very important to support the increase in income levels and reduce income inequality that has an effect on reducing poverty. Research conducted by Bajar and Rajeev (2015) shows that the construction of electricity infrastructure is directly proportional to inequality. It can be concluded, the literature described earlier shows that infrastructure influences economic inequality where there are a hard infrastructure and soft infrastructure in the study, but it cannot yet be determined what type of infrastructure has the most influence on inequality in economic growth. And how is the role of hard infrastructure development on the level of inequality in Indonesia and how the role of soft infrastructure development is to the level of inequality in Indonesia.

The uniqueness of this study, when compared with research related to the influence of infrastructure on growth inequality between regions in Indonesia, is to see whether hard infrastructure or soft infrastructure is the most influential in economic inequality between regions in Indonesia. And how they affect inequality. Whether they can reduce inequality or increase inequality between regions that occur in Indonesia. This research is expected to see what infrastructure is the most influential in reducing economic inequality in Indonesia.

Problem Formulation

Based on the introduction prior, both hard infrastructure and soft infrastructure development may have an influence on economic growth inequality between regions in Indonesia. Hard infrastructure development in an area itself can be reflected by several indicators such as road length, water access, and electricity access. Infrastructure development in the form of roads, access to water and adequate access to electricity certainly encourages increased investment in a region which will later affect economic growth. While the soft infrastructure development in an area can be reflected by several indicators such as the level of health and the level of education of the community. In contrast to the hard infrastructure that encourages economic growth through increasing investment in a region, soft infrastructure promotes economic growth through increasing community production capacity due to increased human capital.

The causes of inequality in economic growth between regions in Indonesia are still being debated. Whether the imbalance of economic growth between regions is caused by the unevenness in the development of hard infrastructure or soft infrastructure. Based on the statement, this research is expected to answer the question of how is the influence of infrastructure development on economic growth inequality in Indonesia? Which is the most influential, hard infrastructure or soft infrastructure?

Purpose and Use of Research

Based on the background and formulation of the problem described earlier, this study aims to determine the effect of infrastructure development carried out by the Government of Indonesia on economic growth inequality between regions in Indonesia as well as which hard infrastructure or soft infrastructure development contributes to the increase and decrease in inequality happened in Indonesia. So that this research is expected to provide information on the influence of hard infrastructure and soft infrastructure development on the imbalance of economic growth between regions in Indonesia.

LITERATURE REVIEW

According to Chotia and Rao (2017), infrastructure in this case in the form of bridges, access to clean water, sanitation, access to electricity, and roads are important factors in the socio-economic life of individuals and households. This proves that the growing inequality between regions in Indonesia is caused by differences in infrastructure development that have been mentioned previously. In addition, Chotia and Rao (2017) say that infrastructure can increase income levels and reduce income inequality and infrastructure development is a strong factor in reducing poverty. Increasing the level of opinion and reducing poverty will ultimately have an impact on reducing growth inequality between regions. Therefore, infrastructure development is a top priority for development in several countries.

The length of the road was chosen as one of the factors affecting growth inequality between regions because of its vital function as one of the facilities that drive the flow of goods and services in an area. When the length of the road a region has a good ratio with the area reflects the access between regions within a region. Affordability of access to good goods and services between regions will certainly increase the economic growth of a region.

The influential access to water in economic growth has two perspectives. The first point of view, with the availability of good water access, can increase economic growth due to the availability of clean water as one of the inputs in the production process of the industrial sector in a region. While the second point of view is that the availability of good access to clean water will increase people's human capital. With the availability of good access to clean water, it will increase the level of public health, which in turn will have an impact on increasing community productivity so that the economic growth of a region will increase.

Similar to water access, electricity access also has two perspectives in influencing economic growth. The first point of view, with the availability of access to electricity, will increase economic growth through increased production capacity in the industrial sector. The availability of access to electricity is certainly one of the factors that can attract investors to invest and produce in a region. In the end, this will certainly increase the economic growth of a region. The second point of view is the availability of access to electricity will increase economic growth through increased productivity of each individual. With the availability of access to electricity will increase the time that can be used by someone to carry out production activities. In addition to increasing the length of time in production activities, the availability of access to electricity will also increase the number of goods or services produced at the same time and without the availability of electricity.

This contrasts with the macroeconomic theory that Solow stated in a study conducted by Huang, Fulginiti, and Peterson (2010) where Solow argues that long-term economic growth is influenced by capital- labor accumulation. In his theory, Solow said that an important factor in increasing economic growth is an increase in the quality of human beings in terms of labor and the growth of the working age population. Of course, improving human quality needs to be supported by an infrastructure that is oriented towards increasing the productivity of the community in the form of increasing the level of health and education level of the working age community.

In accordance with the research of Neeliah and Seetanah (2016), human capital has an important role in long-term economic growth. Human capital can affect economic growth both in terms of production and innovation. This shows that human capital is an important component in determining labor productivity, labor demand, and output growth. In accordance with the endogenous growth theory, human capital is a part of the capital that can support productivity. Workers with good health and education will be able to use existing capital and technology more efficiently. Therefore, the level of health and education can affect labor productivity, which at the end will determine the economic growth of a region. In this study, health and education are used as proxies for human capital and are classified as soft infrastructure.

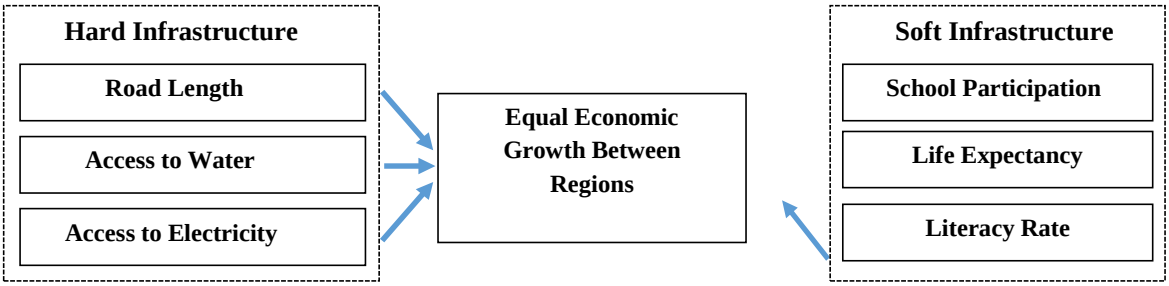

Figure 8 *Research Framework*

METHODOLOGY

Data

In order to achieve the goal, this study uses panel data of 34 provinces in Indonesia with a period of 2013-2016 as a cross-sectional element as well as the form of annual data from 2013-2016 as a time series element. The use of data from 34 provinces is considered important to achieve the research objectives so that the characteristics of each province towards infrastructure development can be more visible. The variable used is the Williamson Index as the level of development inequality between regions. While the length of the road, access to water and access to electricity are the levels of hard infrastructure development. Then the level of health and level of education are indicators of soft infrastructure development. The authors will use the data available on several government websites such as the website of the Badan Pusat Statistik (BPS) Indonesia, Statistika Ketenagalistrikan Report and the Buku Informasi Statistik Indonesia

PCA Analysis Model

PCA is a technique used to simplify data, by transforming linearly into a new coordinate system with maximum variance. PCA can be used to reduce the dimensions of data without significantly reducing the characteristics of the data. The main component analysis is a statistical technique for changing from most of the original variables used that correlate with each other into a new set of variables that are smaller and mutually independent (no longer correlated). So the main component analysis is useful for reducing data, so it is easier to interpret the data (Johnson & Wichern, 1982). This PCA model is used to simplify the soft infrastructure variable which consists of several variables, namely life expectancy, school participation rates, and literacy rates. In addition, hard infrastructure index formation is also carried out using PCA in which there are long roads, electrification, and water infrastructure in the form of irrigation.

Ordinary Least Square (OLS)

This study uses OLS analysis techniques. OLS itself is an econometric method where there are independent variables which are explanatory variables and dependent variables as variables described in a linear equation. In the OLS model, there is only one dependent variable, while for the independent variable the number of variables consists of one or more variables. This paper uses one equation that is used to look at the Williamson Index variable as the dependent variable which is influenced by independent variables namely road length, water access and electricity access as variables that represent the hard infrastructure and education level and health level as variables representing the soft infrastructure. Using this analysis technique, several research models can be formed as follows:

$IW = \beta_0 + \beta_1 SII + \beta_2 HII + \varepsilon$

IW = Williamson Index

β_0 = Constants

$\beta_1 SII$ = Soft infrastructure Index

$\beta_2 HII$ = Hard infrastructure Index

ε = Error Term

Based on the model, it can be seen that the Williamson Index variable becomes the dependent variable or becomes an endogenous variable for other variables. The use of the model is intended to see the effect of independent variables on the dependent variable. This will show how the effect of road length, water access, electricity access, life expectancy,

school enrollment rates, and literacy rates against the Williamson Index. The use of OLS is considered appropriate for examining the effect of hard infrastructure (road length, water access, electricity access) and soft infrastructure (life expectancy, school participation rates, and literacy rates) on economic growth inequality between regions in Indonesia.

EMPIRICAL RESULT

PCA Analysis Result

In this study, PCA was used as a tool to reduce data to form an index namely the Soft Infrastructure and Hard Infrastructure Index. The soft infrastructure index consists of literacy rates, school enrollment rates, and life expectancy. Meanwhile, the hard infrastructure index consists of road length, electrification rate, and irrigation.

Soft Infrastructure PCA Analysis Result

The formation of PCA must fulfill the assumption in the form of Kaiser Meyer Olkin Measure of Sampling (KMO), which is an index of the comparison of the distance between the correlation coefficients and their partial correlation coefficients. KMO values are considered to meet if greater than 0.5. In addition, there is another assumption in the form of Bartlett Test of Sphericity. This assumption will be considered as fulfilling if it has a significance level below 0.05 (5%). The following are the results of the KMO and Bartlett Test of Sphericity tests for hard infrastructure.

In accordance with the KMO and Bartlett Test of Sphericity test results above, the KMO results are 0.526. These results indicate that the variable school enrollment rates, life expectancy, and literacy rates fulfill the KMO assumption because it has a value greater than 0.5. Where then the data and variables in the PCA are adequate in forming the index. While the Bartlett Test of Sphericity assumption is also fulfilled because it has a significant level of 0,000 and is below 5%. This means that the variables used in forming the index do not have a correlation between one variable and another variable.

Table 1 *TEST OF KMO AND BARTLETT TEST OF SPHERICITY SOFT INFRASTRUCTURE INDEX*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.526
Bartlett's Test of Sphericity	Approx. Chi-Square	34.209
	df	3
	Sig	.000

The PCA test results are in the form of a score coefficient matrix component which will then be multiplied by each standardized variable by means of natural logarithms. The following is the research component score coefficient matrix.

Table 2 *COMPONENT SCORE COEFFICIENT MATRIX SOFT INFRASTRUCTURE*

Variable	Score PCA
LN School Participation Rate	0.686
LN Life Expectancy Rate	0.834
LN Literacy Rate	0.612

Hard Infrastructure PCA Analysis Result

In accordance with the results of the KMO and Bartlett Test of Sphericity tests above, the KMO results are 0.513. These results indicate that the variable length of the road, electrification, and irrigation meet the KMO assumption because it has a value greater than 0.5. Where then the data and variables in the PCA are adequate in forming the index. While the Bartlett Test of Sphericity assumption is also fulfilled because it has a significant level of 0,000 and is below 5%. This means that the variables used in forming the index do not have a correlation between one variable and another variable.

The following are the results of the KMO and Bartlett Test of Sphericity tests for hard infrastructure.

Table 3 *TEST OF KMO AND BARTLETT TEST OF SPHERICITY HARD INFRASTRUCTURE INDEX*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.513
Bartlett's Test of Sphericity	Approx. Chi- Square	48.457
	df	3
	Sig	.000

The PCA test results are in the form of a score coefficient matrix component which will then be multiplied by each standardized variable by means of natural logarithms. The following is the research component score coefficient matrix.

Table 4 *COMPONENT SCORE COEFFICIENT MATRIX HARD INFRASTRUCTURE*

Variable	Score PCA
LN Road Length	0.099
LN Electrification	0.001
LN Irrigation	0.943

OLS Result and Discussion

This study aims to analyze the effect of Hard Infrastructure and Soft Infrastructure on the dependent variable in the form of Index Williamson. To achieve this goal, a regression model was formed as described in the previous chapter. The following are the results of the regression of this research model.

Table 5 *RESULT OF REGRESSION WITH WILLIAMSON INDEX AS DEPENDENT VARIABLES*

Variable	Coefficient	*T*-statistic	Prob
C	0.710471	4.777667	0.0000
SII	-0.066459	-4185703	0.0001
HII	-0.000792	-3630493	0.0004
Effects Specification			
Cross-section fixed (dummy variables)			
Weighted Statistics			
R-squared	0.998132		
F-statistic	1526.542		
N	136		

Regression is done using Fixed Effect Models by weighting the cross-section element on the data. Weighting on cross-section elements is done to overcome multicollinearity and autocorrelation. In accordance with the regression results above, the dependent variable in the form of the Williamson Index as a proxy for economic growth inequality between regions is influenced by both independent variables, namely the soft infrastructure index and hard infrastructure index. The regression test results of this research model indicate that the soft infrastructure index variable has a significant negative effect on α = 1% with a probability value of 0.0001. This variable regression coefficient is -0.066459. It can be concluded that every increase in soft infrastructure by 1% will reduce inequality between regions by 6.64%.

The regression test results of the research model also show that the PCA Hard Infrastructure variable has a significant negative effect on α = 1% with a probability value of 0.0004. The variable regression coefficient of -0.000792. It can be said that every increase in physical infrastructure by 1% will reduce inequality between regions by 0.08%. The regression coefficient of increasing physical infrastructure in an area will certainly encourage economic growth in

the region. By building highways, providing access to electricity for all residents for consumption and production needs, and water for irrigation systems as the production needs of materials for public consumption needs, it will support community productivity so that economic growth also increases. However, the inequality of infrastructure development between regions will certainly produce growth inequality between regions. In Indonesia, infrastructure development since the era of President Joko Widodo began to be evenly distributed between western Indonesia and eastern Indonesia. This certainly not only affects the increase in economic growth in each region but also reduces the imbalance of economic growth between regions in Indonesia.

In Table 5 it can be seen that the regression r-squared value of this study model is 0.998. This shows that 99.8% of economic growth inequality between regions proxied by index Williams can be explained by variables of school enrollment rates and life expectancy as the soft infrastructure index and hard infrastructure index variables which consist of road length, electrification rate, and amount of irrigation. Whereas, the remaining 0.2% can be explained by variables outside of this study.

Through the regression results of this research model, there are similarities between PCA Soft Infrastructure and PCA Hard Infrastructure. Increasing the development of human health and education and the construction of physical infrastructure in each region of Indonesia will reduce growing inequality between regions. However, the regression results above show that the effect of soft infrastructure is greater than the effect of hard infrastructure in reducing growth inequality between regions in Indonesia.

When viewed from the regression results which show that hard infrastructure development reduces regional inequality in Indonesia. This is caused by the length of roads owned by each region in Indonesia. Figure 9. shows that the Java Bali region, which includes Java, Bali and Nusa Tenggara, although experiencing a decline from 2013-2016, still has a longer road length than other regions such as Kalimantan, Maluku, Papua, and Sulawesi. When compared with the land area between regions, the difference in the number of lengths of road between regions shows access from one city to another or within that area. When access between cities and other cities is difficult, the flow of goods and services will be hampered resulting in growing inequality between regions in Indonesia. For extreme example, Maluku and Papua with a wider land area than Java Bali only have a a quarter length of the total length of roads owned by Java and Bali. However, if road construction is more concentrated in lagging regions such as Maluku and Papua, it will facilitate the flow of goods and services in the region and can reduce inequality between regions in Indonesia.

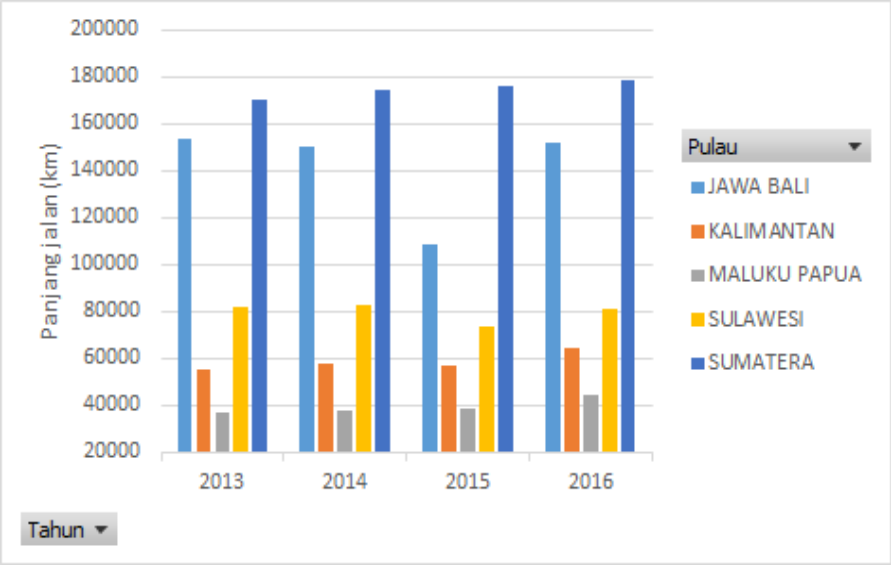

Figure 9 *Total Road Length by Regional (2013-2016) (Source: Buku Informasi Statistik Indonesia)*

In addition, inequality caused by the construction of hard infrastructure can also be seen in Figure 10 which illustrates the growth rate of electrification between regions in Indonesia. The construction of power plants in various regions will certainly have an impact on the productivity of the area, but the regions of Java Bali and Sumatra which are the Western Region of Indonesia have had higher levels of electrification beforehand. Both have an electrification rate of 78.85% and 80.4% in 2013 while the Maluku regions of Papua and Sulawesi as part of Eastern Indonesia only have an electrification rate of 69.49% and 71.98% in 2013. However, through the above graph, it can be seen that growth the

level of electrification in the Maluku region of Papua has been catching up from other regions so that it will reduce inequality between regions in Indonesia.

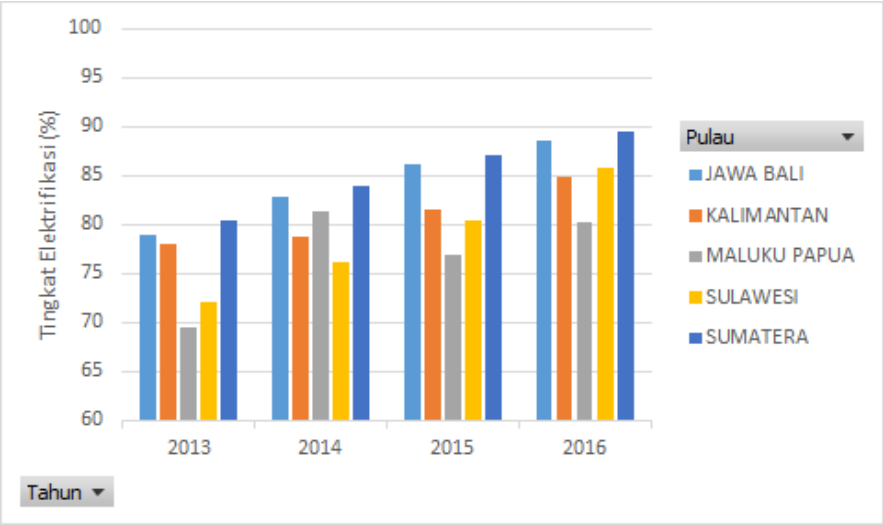

Figure 10 *Regional Electrification (2013-2016) (Source: Buku Informasi Statistik Indonesia)*

When seen in Figure 11 the development of irrigation in Sumatra and Java Bali is very rapid from year to year. In contrast to irrigation development in the Maluku region of Papua and Sulawesi, the increase is very low. Of course, this has an impact on food productivity between regions. When food productivity between different regions will have an impact on the income received by each region. Evidence of good irrigation development can increase productivity shown by Jayapura City, through Kompas.com (2019), explained that by improving irrigation 200 hectares of paddy fields can increase the Agricultural Index (IP) of Jayapura City to increase from 200% to 300%, where IP will reflect business in agriculture in the city of Jayapura. Thus, inequality between regions will decrease further along with the development of infrastructure in the form of hard infrastructure.

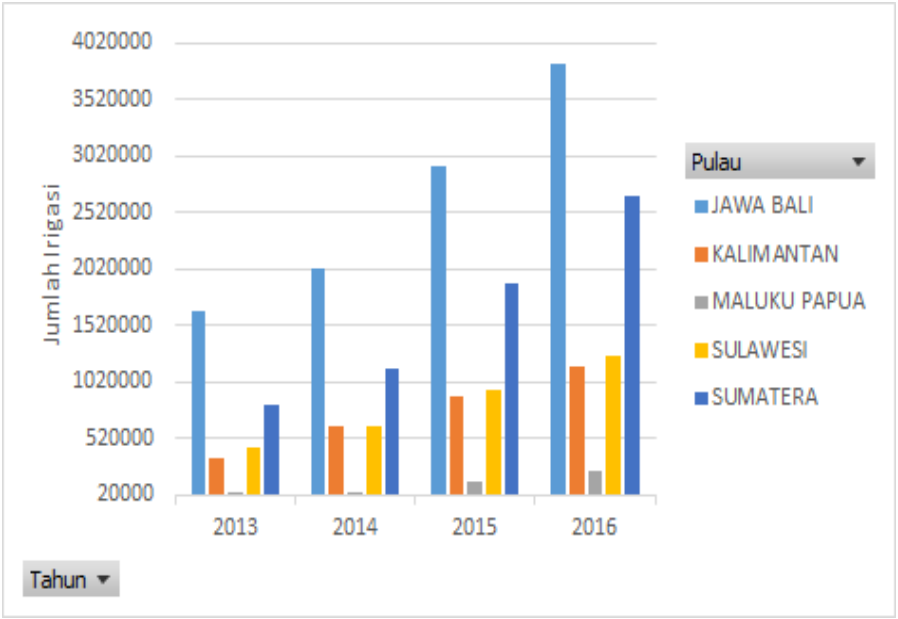

Figure 11 *Regional Irrigation (2013-2016) (Source: Buku Informasi Statistik Indonesia)*

Looking at the data on Figure 12, that life expectancy in an area can affect inequality with life expectancy as a health variable. This proves that soft infrastructure has a role in reducing inequality, especially health. Life expectancy reflects the quality of human resources, especially health and will support the human development index.

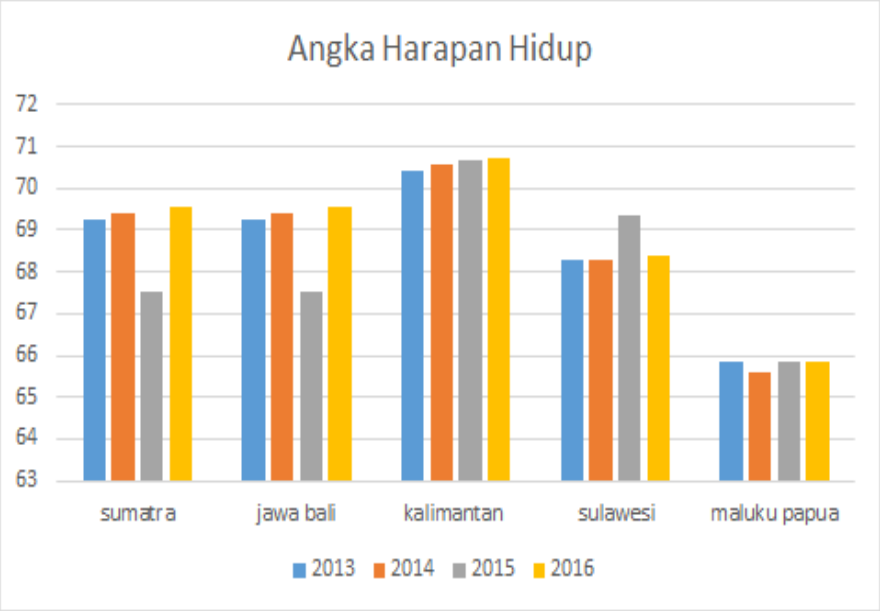

Figure 12 *Regional Life Expectancy (2013-2016) (Source: Buku Informasi Statistik Indonesia)*

Looking at the data on Figure 12, that life expectancy in an area can affect inequality with life expectancy as a health variable. This proves that soft infrastructure has a role in reducing inequality, especially health. Life expectancy reflects the quality of human resources, especially health and will support the human development index.

The above etymology results are also in line with the research of (Haryanti, 2014), which explains that life expectancy has a positive and significant effect on per capita GRDP. The long life expectancy, which is not accompanied by expertise, will become a burden for regional development, which causes an increase in productivity in a region.

This is supported by Sudirman (2014), which explains that education levels and life expectancy have a significant relationship to work productivity. This is supported by the concept of productivity, that the higher the education and health, the labor productivity will increase, it has been proven through statistical tests conducted by researchers. It can be concluded that life expectancy has an indirect effect on the growth of a region. This is in line with government programs under the orders of President Joko Widodo, namely in improving health conditions and quality of human resources to increase productivity for development and national economic equality (CNN Indonesia, 2018).

The estimation results that researchers have done are in line with Anaduaka et al. (2014) and Dauda (2019), in their study explaining that School Participation Figures (APS) have a positive effect on economic growth. When the quality of Human Resources (HR) in an area increases, it will affect the production process of a region. So that it has a positive impact on the area. This is supported by the study of Kurniasari, Warastuti, et al. (2015), which explains the effect of school participation on economic growth. He explained in his research that APS reflects that HR availability. The higher the APS at the level of Senior High School (SMA) and Higher Education, then the HR of an area will be more qualified. It can be concluded, this is in line with President Jokowi's program to improve the quality of human resources to improve national economic development (CNN Indonesia, 2018).

This result is also in line with what has been explained in the study of Neeliah and Seetanah (2016) that public health and education are important things that need to be considered to reduce inequality between regions in addition to the construction of infrastructure in the form of hard infrastructure. With an equal distribution of health and education in each region, the community is increasingly prosperous and inequality decreases.

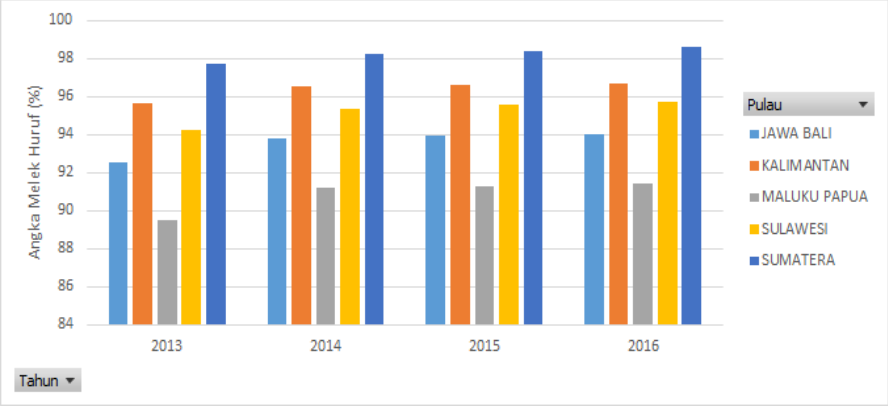

Figure 13 *Literacy by Regional Year 2013-2016) (Source: Badan Pusat Statistik (BPS) Indonesia)*

The estimation results that have been carried out by researchers show that literacy affects the inequality of a region. This is in line with Todaro and Smith (2006) in Kumalasari (2011) who stated that education is the initial stage to improve human development. Education is one of the fundamental things for a country to absorb modern technology to develop HR capacity, to achieve sustainable economic growth and development. So, now the government is trying to improve literacy rates through the Ministry of Education and Culture to provide literacy education services and the development of a community reading culture.

CONCLUSION

Through the results of this study, it can be seen that inequality between western Indonesia and eastern Indonesia continues to decline. However, the government should distinguish the portion of development in each region in Indonesia so that the quantity of infrastructure is evenly distributed throughout the region. In addition, equitable human development in each region in Indonesia will reduce growing inequality between regions. The government should pay attention to human development as a soft infrastructure and be accompanied by the construction of physical infrastructure in each region in accordance with the needs of each region in Indonesia. This is because human development through improving education and health and the development of physical infrastructure are complementary in terms of reducing the level of economic growth inequality between regions in Indonesia. In other words, infrastructure development in Indonesia is complementary between the development of hard infrastructure and soft infrastructure. Both types of infrastructure together have an impact on increasing Indonesia's economic growth. But in its implementation, both must be built together and synergized so that efforts to increase economic growth in Indonesia are not accompanied by an increase in economic inequality between regions in Indonesia.

Development synergy of hard infrastructure and soft infrastructure is needed to optimize the potential provided by the government through the development of various hard infrastructure by communities in various regions in Indonesia. Optimization will certainly be in line with the quality of human resources in a region due to the increase in human development through the soft infrastructure. If a region has good quality human resources, of course, hard infrastructure development in the region will be able to increase the productivity of the community.

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