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Analysis of the Role of Universities in Supporting Sustainable Growth: the Case in Indonesia

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Abstract

Indonesia is predicted to experience a demographic bonus period in 2030. In order for Indonesia to get the maximum benefit from this demographic bonus, the availability of abundant productive-age human resources must be balanced by improving the quality of education and skills. Educated and competitive human resources need to be improved in terms of the number and quality of competitiveness to support sustainable growth. In this research, the authors want to see the role of universities in influencing economic growth. The role of universities can be measured by the number of universities, college enrollment rate and the human development index (HDI). The analysis used in this study is multiple linear regression analysis. The research data used are panel data, data from 34 provinces in Indonesia with the study year 2015 - 2018.

Keywords: Economic growth, Universities, College enrollment rate, HDI

1. Introduction

Indonesia will face a demographic bonus in 2030. The population of Indonesia is predicted to be 305,652,000 million. Thus, human resources are things that must be optimized. Indonesia is highly expected to have one of the objectives in line with sustainable development goals (SGD), which is about sustainable economic growth, higher levels of productivity and technological innovation. Increased productivity levels can be achieved due to full and productive employment, and decent work for all women and men by 2030. The availability of abundant human resources at productive age must be balanced with an increase in quality in terms of education and skills. All countries view universities as having a very important role in producing human and labor resources that can advance economic interests in a highly competitive environment in the global market [1].

Based on several studies, it shows that the higher the level of someone's education, the better job they will get. Similarly, all countries are interested in raising the average level of schools in their population. By increasing the average level of education, it is expected to increase productivity, improve the quality of work in the economy and increase economic growth. Higher education plays an important role in determining the competitiveness of a country or region. The University has a contribution to the economy in terms of providing a competent workforce. Universities are expected to transfer knowledge and technology through seminars, research publications, or reports to policy makers. Increasing employment and focusing on economic structuring are key tools for improving the level and quality of education. But in Indonesia higher education is not free and is an expensive investment. Without significant education reforms, Indonesia cannot expect positive change to occur because significant social and economic structuralism is needed [2].

The growth rate of the labor force has a positive and significant effect on economic growth so the need to improve the quality of the workforce. It is important to prepare a quality workforce that is superior, skilled and reliable, balanced with the quantity of the Indonesian population. Education is currently considered important as an investment in human resources used in sustainable economic growth. Thus, the government must increase education investment and improve service efficiency to develop more talent. In this study, the authors want to see the role of universities in influencing economic growth. The role of universities can be measured by the number of universities, the college enrollment rate and human development Index (HDI). Many factors affect economic growth. The time limitation of making research must focus on the influence of the number of universities, college enrollment rate and HDI in Indonesia [3].

2. Research Method

The economic growth model in the basic production function discusses human resources as additional inputs in the aggregate production function, where macroeconomic output is a direct function of input factors: physical capital, labor and human capital that drives technical progress or productivity. The new economic growth model optimizes the potential of human resources with the power of science, natural resources, technological assets, and institutions. This theory of economic growth is known as the endogenous growth theory. Endogenous growth theory states that education will   create innovation, knowledge about the development of new ideas and technologies in producing products, thereby contributing to economic growth. According to human capital theory, higher education will affect one's present and future well-being. Investing in human capital affects future real income. Human capital investment can be in the form of education. Higher education will increase one's ability, so that it will increase productivity. Because productivity increases, income will also increase [5].

2.1. Effect of The Number of Universities on Economic Growth

Research conducted using 1950-2010 data on 15,000 universitiesin around 1,500 regions in 78 countries using a fixed effect model, found that increasing the number of universities had a positive influence on future gross domestic product (GDP) per capita growth. If there is a 10% increase in the number of universities per capita in a region is associated with 0.4% GDP growth per capita in the future. The research also shows that the relationship between GDP per capita and the number of universities is not   only driven by direct expenditure of universities, staff, and students. Part of the influence of universities   on growth is mediated through increased supply of human capital and greater innovation. Educational investment plays an important role in influencing economic growth. An increase in education investment of 1% will affect the increase in gross GDP by an average of 0.14% [6].

2.2. The Effect of college enrollment rate on Economic Growth

College enrollment rate can demonstrate the quality of government services to the rights of the community to gain access to tertiary education. College enrollment rate also shows that the community has easy access to higher education. College enrollment rate shows the participation of people who are currently educated according to their level of education. College enrollment rate measure the proportion of the population in the age group of higher education who are still educating the population in the age group of 19-24 years). Calculating the college enrollment rate for each province is the percentage of students who are residents in the province where they are studying. A person's level of education affects the level of productivity of goods and services. Someone with a high school education will have different levels of productivity when compared to someone with a bachelor's education. A high level of education will produce a high level of productivity. There is a positive relationship between human capital and economic growth which will be seen from the level of registration at various school levels for human resources and the GDP for sustainable economic growth [7].

2.3. Effect of HDI on Economic Growth

HDI is a measurement of life expectancy, education and standard of living for all countries throughout the world. The high HDI illustrates that the province has good quality human resources. The faster human development by equalizing education and health, economic growth will achieve increased productivity and employment opportunities. So HDI contributes positively to economic growth. Economic growth is the main driver in increasing HDI and vice versa, HDI is one of the important factors in creating quality economic growth [8].

3. Results and Analysis

Sources of data in this study came from the Ministry of Education and Culture and the Statistics Indonesia in 2015-2018.
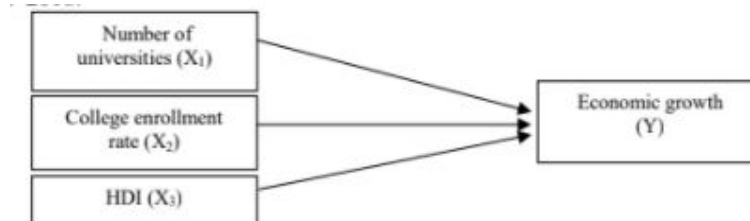

Figure 1. The Relationship Between the Independent Variable and the Dependent Variable

Table 1. Operational Definitions of Research Variables

Variable	Conceptual Definition	Units of measurement
Economic growth (Y)	The percentage of real gross regional domestic product (GRDP) compared to the current year against the previous year.	Percent
Number of universities (X_1)	Number of universities registered at the Ministry of Education and Culture.	Unit
College enrollment rate (X_2)	Percentage of the number of people who are currently studying at university to the total population aged 19-24 years old.	Percent
HDI (X_3)	An index that measures how people can access the results of development in obtaining income, health and education.	Point

4. Result and Discussion

4.1 Regression Test Analysis Point

In this study using multiple regression, with panel data, the first step taken is to do a chow test. Chow test is used to determine whether the model is between a common effect or a fixed effect. H0 is rejected if the value of probability F is smaller than Alpha, which is smaller than 0.05, where H0 is the common effect model and H1 is the fixed effect model [9].

Table 2. Chow Test Result

Effect Test	Statistics	d.f.	Prob.
Cross-section F	1.669010	(33,98)	0.0281
Cross-section Chi-square	60.206713	33	0.0026

Hypothesis:
H0 : Common Effect
H1 : Fixed Effect

The redundant fixed effect or likelihood ratio result for this model has a probability value of F of 0.0000 smaller than alpha 0.05, so H0 is rejected and H1 is accepted, the corresponding model of this result is fixed effect. The Hausman test is used to choose between fixed effect or random effect. A better fixed effect model is indicated by the significance value < 0.05 on the chi-square probability value [10].

Table 3. Hausman Test Result: Fixed and Random Effects

Test Summary	Chi-sq. Statistics	Chi-sq. d.f.	Prob.
Cross-section random	3.641083	3	0.3029

Hypothesis:
H0 : The model follows the random effect

H1 : The model follows the fixed effect

Based on the results of the Hausman test showed a significance value of 0.3029 (significance> 0.05), then H0 was rejected and H1 was accepted, so it could be interpreted that the random effect model was better than the fixed effect model. Next, use the results of the random effect model to see the results of the regression analysis. (T test, F test, coefficient of determination). Based on the results of the Hausman test showed a significance value of 0.3029 (significance> 0.05), then H0 was rejected and H1 was accepted, so it could be interpreted that the random effect model was better than the fixed effect model [11].

Next, use the results of the random effect model to see the results of the regression analysis. (T test, F test, coefficient of determination) [12].

Table 4. Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.29745	4.475753	3.417850	0.0008
X_1	0.001955	0.002991	0.653527	0.5146
X_2	0.034566	0.026192	1.319727	0.1892
X_3	-0.160690	0.069142	-2.324063	0.0217

$$Y = -0.160690X3 + e$$

The number of universities does not affect economic growth. The regression results show that the regression value is 0.001955. College enrollment rate has no effect on economic growth. The regression results show that the regression value is 0.034566 and both have probability values above 0.05. Education and investment in physical capital on economic growth in Greece, proves that education has no significant relationship with economic growth. There is no statistical relationship between college graduates and economic growth in the 15 countries studied between 1980-2000. Use a meta analysis approach to review empirical research on the relationship between educational development and economic growth. This study did not find an impact of representative educational growth, because different educational steps lead to various coefficients of the size of the effect of education on economic growth [13].

HDI has a negative relationship with economic growth. The regression results show that the regression value is -0.160690. If there is a 1% increase in HDI in Indonesia, it will affect the rate of economic growth which will decrease by 0.160690%, assuming the other independent variables remain the same. HDI causes a negative effect on the rate of economic growth. This is because in improving HDI which includes 3 things, namely about longevity and healthy living, knowledge and decent living standards, people need more money so that economically the community and government are more focused on increasing HDI rather than economic growth [14].

In line with the results of this study, states that public spending on education and health has a negative impact on economic growth. Research conducted in 49 countries in Africa, found that negative effects arise from inefficiency, corruption, bureaucracy, and lack of investment in the health and education sectors. The results of research conducted by Iskandar, show that moderation between the HDI through special autonomy funds has a significant negative effect on economic growth. This happens because the use of special autonomy funds for the HDI continues to rise, but its use is not allocated according to needs in 23 districts / cities in North Sumatra province. So, there is no increase in HDI even though economic growth is increasing [15].

4.2. The Success of the Provinces in Indonesia in Providing the Number of Universities in Accordance with Their Needs

The number of universities in each province illustrates the ability of a province to provide universities. The availability of universities in a province must be balanced with the college enrollment rate. It is not good if there are a lot of universities, while the college enrollment rate is low. This will lead to a lack of the role of universities in educating the community to the fullest due to the lack of students. Conversely, if the number of universities is small but the college enrollment rate are large, the role of universities in teaching is not optimal. This is due to the imbalance between facilities and infrastructure in teaching activities. For example, the universities will experience a shortage of teaching staff and a shortage of learning classes [16].

In Indonesia (see figure 2), there are several provinces that experience inequality or a large gap between the number of universities and college enrollment rate. The biggest gap is West Java Province. West Java Province has 394 universities, but the percentage of the number of people who are currently studying in universities to the total population of college age (college enrollment rate) of West Java Province is very low, at 25.14%. This means that there are only a few indigenous people of West Java who have received tertiary education, assuming they prefer to work rather than study. Students who study in West Java are students from outside West Java [17].

The gap between the number of universities and college enrollment rate seen from the smallest level of inequality is the Provinces of West Papua, Maluku and D.I. Yogyakarta. This shows the balance carried out by the Province in the provision of universities in facing the college enrollment rate.
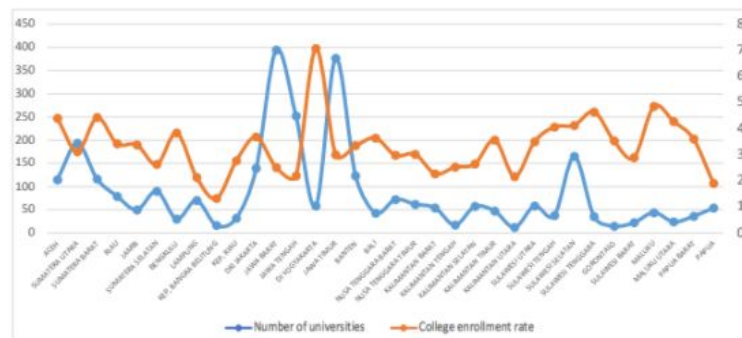

Figure 2. Comparison Between the Number of Universities and College Enrollment Rate in 2018 Based on Provinces in Indonesia

College enrollment rate is used to measure the success of educational development programs that are held in order to expand opportunities for residents to receive tertiary education. College enrollment rate is an indicator to measure the absorption capacity of school age population (19-24 years old) in universities. The college enrollment rate means that more school-age children attend high school and the ideal score is 100%. The highest college enrollment rate came from D.I. Yogyakarta, which is 70.6%. While the college enrollment rate is owned by Kep. Bangka Belitung, 13.2%. The average college enrollment rate in 2018 in 34 Provinces is 33.67% (see figure 3). This means that the average population at the age of 19-24 years old is still a lot or around 66.33% not getting education at universities. This could be due to the productive age, people prefer to work rather than have to continue to higher education. Province that has a college enrollment rate value above the average value is D.I. Yogyakarta, Maluku, Southeast Sulawesi, West Sumatra, Aceh, North Maluku, South Sulawesi, Central Sulawesi, Bengkulu, DKI Jakarta, Bali, East Kalimantan, Papua, North Sulawesi, Gorontalo and Riau [18].
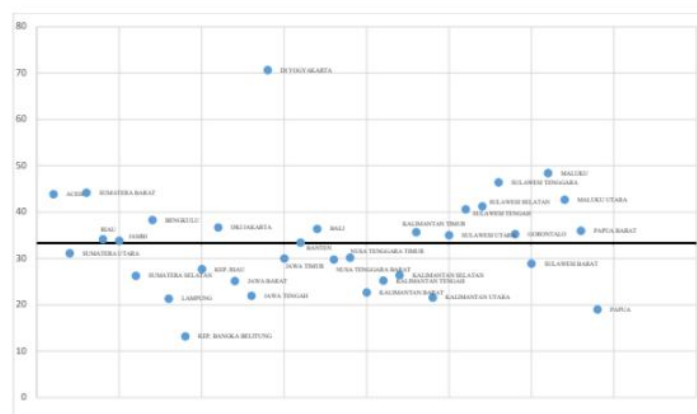

Figure 3. College Enrollment Rate in 2018 by Province in Indonesia

5. Conclusion

The demographic bonus that is being enjoyed by Indonesia and is expected to continue to increase until 2030 needs to be put to good use to promote growth and sustainable economic development. Educated and competitive human capital needs to be improved in terms of the number and quality of competitiveness to encourage quality growth and compete with foreign workers. The role of universities in Indonesia is not yet optimal in supporting Indonesia's economic growth in terms of the number of universities and college enrollment rate that have not had an impact on economic growth. This is because there are still many provinces that experience inequality in the provision of number of universities with college enrollment rate.

HDI has a negative impact on economic growth. This is because in improving HDI which includes 3 things, namely about longevity and healthy living, knowledge and decent living standards, people need more money so that economically the community and government are more focused on increasing HDI rather than economic growth. There are three suggestions that can be submitted in this study for the government and universities in Indonesia. The first suggestion is government and universities needs to pay attention to accessibility for the community to be able to pursue universities at an affordable price. This can be done through implementing distance learning with the concept of e-learning. Cheap education can also be done by increasing the number of vocational colleges, because currently 94% are academic based universities, while only 6% are vocational colleges.

According to data from the Ministry of Education and Culture in 2018, the number of vocational colleges in Indonesia is only 300 out of 4,760 universities. The second suggestion is government and universities need to improve the quality of universities in order to produce quality graduates. The quality improvement can be in the form of an increase in education facilities such as the use of technology and an increase in the number of classes as an increase in the capacity of students, an increase in the ability of lecturers and an increase in the education budget coming from the center and the regions. And the last suggestion is government and universities needs to encourage the improvement of the competitiveness of its graduates through increased competence in accordance with the needs of the world of work, increasing the variety of skills needed and lifelong willingness to learn, and encouraging entrepreneurial programs.

6. Acknowledgments

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