

Correlation Between Bruto Domestic Products (GDP) With Duty Schools Based On Statistics Center Data Using Pearson Correlation Method Case Study : Indonesia 2008 - 2011

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Abstract—This study aims to analyze the linkage of dropout rates with Gross Domestic Product (GDP). The data source of this research is the Central Bureau of Statistics (BPS), with data acquisition of GDP and dropout rate of elementary, junior and senior high school year 2008 until 2011. Data obtained through quantitative approach with secondary data source. The connectedness value between school dropout and GDP at primary level was 0.7294 in 2008, 0.7225 in the year of 2009, 0.4393 in 2010 and 0.3878 in 2011. While the relationship between the number of dropouts and GDP of junior high school level is 0.6095 in 2008, 0.6238 in 2009, 0.3605 in 2010 and 0.2467 in 2011. while the relationship between the drop out rate and GDP of the SMA level was 0.6061 in 2008, 0.5965 in 2009, 0.5321 in 2010 and 0.2606 in 2011.

Keywords—dropout, PDB, Pearson correlation

I. INTRODUCTION

In the Indonesian dictionary, the meaning of education is the process of changing the attitude and behavior of a person or group of people in an effort to mature man through the efforts of teaching and training. It means that education aims to change a group or the whole to become more desirable. In the field of academic education will be related to certain sciences such as mathematics, language, social and others.

Education becomes a unity with culture in one department. This indicates that education is a mirror of a culture that exists in a country [1]. With the education of a culture will be preserved and make a positive value of a country. As well as some of the existing culture in the State of Indonesia is back home every holiday. In addition, there is a regional culture that is preserved by each region through the world of education.

Education is a pillar for a nation in action for the development of a nation [1]. In Indonesia, the education required for all citizens is 9 years of basic education. The same right to education means that there is no social, economic, and cultural background that differentiates in obtaining education for each student.

Implementation of this 9-year compulsory education cannot run smoothly just like that, but there are some

obstacles faced by the government. One of the problems that arise in the achievement of 9-year compulsory education is that students who drop out and who can not continue their education to a higher level. From 2008 to 2010 student dropout rates in Indonesia were relatively stable but in 2011 there was a 56% decline from the previous year [2], this indicates a significant change in 2010.

One of the factors causing dropouts is the economic factor that currently leads to global issues, namely poverty which is directly affected by income, family welfare level and amount of savings [3]. To overcome this global issue, the state has increased education funds up to 20 percent of the state budget. The proportion of government spending on the education sector, both on total development expenditure and Gross Domestic Product (GDP), indirectly indicates the government's reaction to the increasing demand for educational facilities and infrastructure.

In the 1945 Constitution Article 31 states that every citizen is entitled to education, even every citizen is obliged to follow basic education and the government is responsible for financing it. This indirectly shows how far the government realizes the importance of education [4]. So it is important to know the extent of government support for education in the range of 2008 to 2011.

The discovery of the correlation between two variables can be used to determine the relationship between them so that they can be used as a basis for making a causal diagram, in the case of telecommunications companies correlation analysis can be used as a basis for determining customer churn [6]. In the social case, correlation analysis can be used as a basis for determining the relationship between variables that affect public welfare [4]. It is expected that correlation analysis can find a connection between gross domestic product and the drop out rates of school students.

II. RESEARCH METHOD

A. Education

Education is a conscious and well-planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have spiritual

power, self-control, personality, intelligence, noble character, as well as the skills needed by them, society, nation, and state (UU no. 20 year 2003).

Education is closely related to the quality of human resources (Human Resources) and the progress of the nation, now and in the future.

In the field of education, Indonesia has achieved tremendous progress for the achievement of the MDG (Millennium Development Goals) in the field of universal basic education and gender equality. However, there are still around 2.3 million 7-15-year-olds who are not in school. West Java, Central Java, and East Java provinces, where some of Indonesia's population, there are 42 percent of school children. (UNICEF, Annual Report 2012). The government should follow up on the 9-year compulsory education program and ensure the calibration of opportunities for education for all school-age students in Indonesia.

But not all students in Indonesia can feel the same opportunity because constrained unevenness of 9-year compulsory education program. As a result, many students are still forced to drop out of school. This fact is evident in the high number of poor people in Indonesia whose children drop out of school to no school at all because of lack of motivation and desire for school in the child so decided not to quit school.

Many factors that cause drop out students, economic factors, location factors or distance of school and learning interest is lacking. One of the most dominant main factors is the economic factor.

B. PDB

According to the Central Bureau of Statistics, one of the important indicators to know the economic condition in a country within a certain period is the data of Gross Domestic Product (GDP), either on the basis of current prices or on the basis of constant prices. GDP is basically the amount of value added generated by all business units within a given country or is the sum of the value of final goods and services produced by all economic units. GDP at current prices illustrates the value added of goods and services calculated using the prevailing prices for each year, whereas GDP at constant prices represents the added value of the goods and services calculated using the prevailing price for a given year as a basis. GDP at current prices can be used to look at economic shifts and structures, while constant prices are used to determine economic growth year after year.

The proportion of government spending on the education sector, both on total development expenditures and Gross Domestic Product (GDP), indirectly shows the government's reaction to the increasing demand for educational facilities and infrastructure. Indirectly it shows how far people realize the importance of education.

C. Pearson Correlation

Pearson Correlation method or also called Pearson Product Moment Correlation Method. The Pearson Correlation Method is a correlation used for continuous data

and discrete data suitable for parametric statistics. When the data is large and has parameters such as the mean and standard deviation of the population. Pearson correlation calculates correlation using variations of data. The diversity of data can show the correlation. This correlation calculates the data as it is, does not rank the data used. When data are numerical data such as rupiah exchange rate, financial ratio data, economic growth rate, and other numerical data samples, the Pearson product moment correlation is suitable for use. The formula used to calculate the Simple Correlation Coefficient is as follows,

$$r_{XY} = \frac{n \sum XY - \sum X \sum Y}{\sqrt{n \sum X^2 - (\sum X)^2} \sqrt{n \sum Y^2 - (\sum Y)^2}} \quad (1)$$

Explanation (1) includes n which is the number of pairs of data X and Y, $\sum X$ shows the amount of variables X, $\sum Y$ shows the amount of variables Y, $\sum X^2$ shows the squares of total number of variable X, $\sum Y^2$ shows the squares of total number of Variable Y, $\sum XY$ shows the squares of total number of variable X and variable Y.

III. RESULT AND DISCUSSION

A. Data Collection

To obtain data that is really accurate, relevant and valid then the authors collect data using secondary data analysis. Secondary data is indirect data. These data are Gross Domestic Product (GDP) between 2008 to 2011 and the School Dropout Rate between 2008 to 2011, sourced from the Central Bureau of Statistics.

B. Data Processing

From several data processing methods that exist and many references, chosen one method that eventually used in this research is Pearson Correlation Method or also called Pearson Product Moment Correlation Method. Pearson correlation method is the correlation used in parametric statistics, while for the data type is continuous data and discrete data.

C. Education Data

The Department of Education and Culture of the Republic of Indonesia is an institution under the president who deals with and conducts education in the Republic of Indonesia. In the education system in Indonesia is divided into two parts, the first is compulsory education starting from elementary school to high school, the second is higher education that is supervised and managed by the Ministry of Research and Technology. From the data obtained from the Central Bureau of Statistics (BPS) Indonesia, obtained data dropout numbers as shown in table 1,

TABLE I. NATIONAL DROP OUT RATE [1][2]

Year	Dropout Rates
2008	437.608
2009	445.075
2010	439.033
2011	248.988

In table 1 the data of drop out rates every year does not always indicate an increasing number, but there is a decrease especially in 2011.

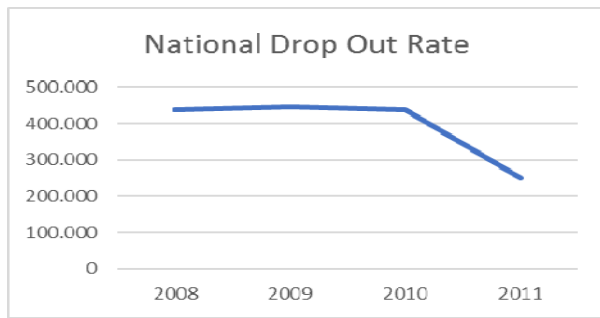


Figure 1. National Drop Out Rate [1][2]

From figure 1, it can be seen that there is a decrease in dropout rates. many things can influence the decline, one of which is a government program to support education or other external causes.

D. PDB Data

One of methods for calculating national income is GDP. In the economic field, GDP represents the market value of all goods and services produced by a country in a given period. GDP value data obtained from the Central Bureau of Statistics then processed so as to generate data that will be used to calculate the relationship with the value of drop out of school (table 2).

TABLE II. PDB [2]

Year	PDB
2008	510,2
2009	539,6
2010	755,0
2011	893,0

In table 2 the GDP value of each year is always increasing, in 2008 to 2009 the increase is not too high but then in the next year in the year 2010 to 2011 value of GDP has increased rapidly.

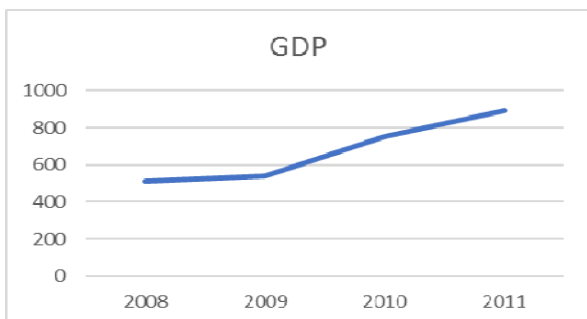


Figure 2. GDP[2]

from figure 2, there is an increase in Indonesia's GDP. In 2009 to 2011 there was a significant increase compared to 2008. Economic growth can be interpreted as a process of changing the economic conditions of a country on a

sustainable basis to a better state during a certain period. Economic growth can also be interpreted as a process of increasing the production capacity of an economy which is realized in the form of an increase in national income.

E. Examination

Testing is done by calculating data from BPS. The test result data will be analyzed to get the conclusion of linkage analysis of dropout rate with GDP.

TABLE III. CORRELATION GDP AND NUMBER OF DROP OUT RATES

	2008	2009	2010	2011
Primary School	0,7294	0,7225	0,4393	0,3878
Junior High School	0,6095	0,6238	0,3605	0,3467
Senior High School	0,6061	0,5965	0,5321	0,2606

Table 3 shows the results of the correlation divided into 3 levels, namely Elementary School (SD), Junior High School (SMP) and Senior High School (SMA). The highest score was owned by elementary school in 2008, and the lowest value was owned by Senior High School in 2011

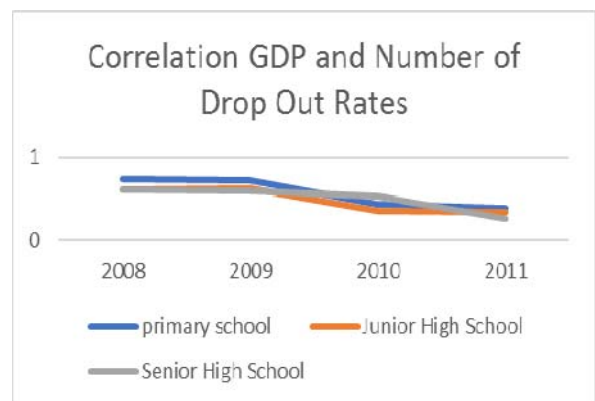


Figure 3. Correlation GDP and Number of drop out rates

IV. CONCLUSION

From the results of calculations using the Pearson, Correlation method obtained positive results which means the relationship between two variables are directly proportional or if the variable A rises, then the variable B come up. In other words, if the drop out value will affect GDP or decrease GDP.

The connectedness value between school dropout and GDP at primary level was 0.7294 in 2008, 0.7225 in the year of 2009, 0.4393 in 2010 and 0.3878 in 2011. While the relationship between the number of dropouts and GDP of junior high school level is 0.6095 in 2008, 0.6238 in 2009, 0.3605 in 2010 and 0.2467 in 2011. while the relationship between the dropout rate and GDP of the SMA level was

0.6061 in 2008, 0.5965 at in 2009, 0.5321 in 2010 and 0.2606 in 2011.

The conclusion of the linkage analysis between the number of dropouts and GDP is that the large amount of government aid to education with increasing GDP can not necessarily reduce the number of dropout rates. But the trend of connectedness every year is getting weaker which indicates the beginning of the relationship between the increasing number of GDP with the number of dropouts in Indonesia.

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