Measurement Availability of Clean Water and Elementary Teachers towards Income of all Districts and Cities in Indonesia

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Abstract

The performance of an area can be reflected by the achievement of the level of income in that region. In Business Cycle Theory so many economic and non-economic factors that affect the level of income. This study wants to reveal how crucial the availability of clean water and primary school teachers are in supporting local economic prosperity in every district and city in Indonesia surveyed. The presence of elementary school teachers has the role of educating students and making the community environment more conscious to improve a better life. Clean water can play a role in meeting basic needs and activities more efficiently and can determine economic decisions. This study uses cross section data with 501 districts and cities throughout Indonesia. The test results prove that the presence of elementary school teachers and clean water significantly influences the local gross domestic product significantly. The results of this study also suggest increasing the number and quality of primary school teachers and access to clean water intensively to achieve the nation's development programs.

Keywords
GDRP, Clean Water, Elementary Teacher

1. Introduction

Macroeconomy becomes an important object from time to time because the results of economic activity are the focal point of the success and failure of a nation. Some macroeconomic indicators are price stability, exchange rates, unemployment rates, interest rates, income gaps and economic growth. From these macro indicators, economic growth has become the most important and important indicator. Economic growth concerns the efforts and hard work of the individual country and group cooperation in producing output in the form of goods and services (Budiono, (2011), Budiono & Purba (2019), Rajewski, (2001)). One important indicator to determine the economic conditions in a country in a given period is Gross Domestic Product (GDP) at current prices and at constant prices. Basically, GDP is the amount of added value produced by all business units in a particular country, or is the total value of goods and final services produced by all economic units (Budiono & Purba, 2019).

GDP at current prices illustrates the added value of goods and services calculated using the prices that apply at each year (Budiono, 2001), while GDP at constant prices shows the value added of goods and services calculated using prices that apply at a certain year as basic. So the magnitude of Gross Domestic Product shows the performance of a country's ability to produce output in the form of goods & services in large quantities and rapid growth rates. GDP is the market value of all goods and services produced by a country in a certain year (Egerer, Langmantel, & Zimmer, 2016). The dynamics of GDP development is a business cycle that is pursued and pursued by a country. The development of GDP is influenced by various factors including economic and non-economic factors (Budiono & Purba, 2019). The following is presented the development of GDP based on constant prices in 2010 during 2009-2019.
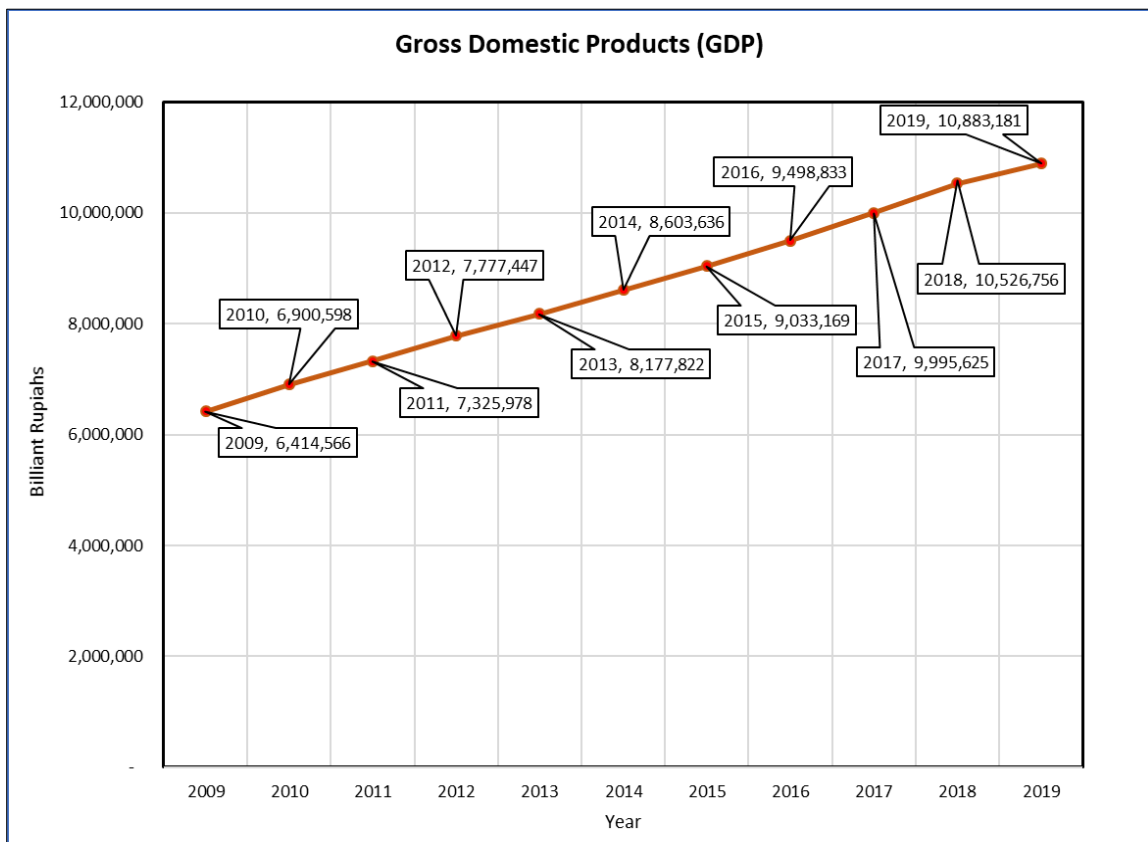

Figure 1. Indonesia Real Gross Domestic Product 2009 – 2019

According to data obtained that during 2009-2019, Indonesia Real GDP has been increasing steadily. This increase in GDP reflects an increase in purchasing power for the community and at the same time shows an increase in welfare. Travel for the past 10 years shows that there are hidden keys to success. Thus this study wants to find out

the main factors that influence income. This income concept is a real Gross Domestic Regional Product (GDRP) without oil.

2. Role of Water and Elementary Teachers

The researcher's assumptions are that there are two main things that have a major contribution to the welfare of the Indonesian people. First, access clean water. Clean water is an important public need for the community. Clean water is used by the community for daily activities so that all activities become more efficient (John Tampil Purba & Budiono, 2019a). Second, the role of elementary school teachers on students and the community environment in regions of Indonesia. Elementary teachers in Indonesia have been sworn in to be placed anywhere in Indonesia. With the hope that elementary teachers play an active role and open the views of students and the surrounding environment to think far ahead. Elementary teachers are one of the crucial agents of change (Budiono (2009).

Water is a basic need for humans, characteristics in management and use are similar to electricity. So that implicit in the phrase `basic needs' is the idea of minimum resource requirements for certain human and ecological functions and the allocation of sufficient resources to meet those needs (Gleick, 1998). Adopting a standard of 5 liter of clean water per person per day for drinking water and 20 liter per person per day for sanitation and hygiene, it is recommended a basic water requirement of 25 liter per person per day to meet the most basic of human needs with an additional 15 litre per person per day for bathing and 10 litre per person per day for cooking. Thus, the need for clean water per individual per day is estimated at the 50 liters (Grey & Sadoff, 2007).

In aggregately, humans require fresh water for three broad uses, namely domestic use which includes drinking, washing, food preparation and general hygiene, agricultural use in order to produce food, and industrial use for non-agricultural commercial activities (Chenoweth, 2008). The major principles that appear to be common to all these new approaches (Pleik, 2000). Basic human needs for drinking water and sanitation services must be met. Basic ecosystem needs for water must be met. The use of non-structural alternatives to meet demands must receive higher priority. Thus, the economic principles must be applied more frequently and reliably to water use and management. New supply systems must be flexible and maximally efficient; Non-governmental organizations, individuals, independent research organizations, and other affected stakeholders must all be involved in water management decisions (John Tampil Purba & Budiono, 2019b).

In accordance with the provisions of the education law in Indonesia that the Teacher is a profile that exists in the environment of schools, and households. In the law of the Republic of Indonesia number 14 of 2005 article 1 the teacher is a professional educator with the main task of educating, teaching, guiding, directing, training, evaluating, and evaluating students in early childhood education through formal education, basic education, and secondary education (Purba, 2014). A teacher has a very important role in the classroom namely educating, teaching, guiding, directing, training, assessing, and evaluating learning. The teacher has the role of conveying the knowledge possessed to his students. The teacher is a source of learning for students. The teacher teaches reading, writing and arithmetic. Students get new knowledge and character education from the teacher. The teacher is the second parent in the school after the biological parent at home (Harden & Crosby, 2000).

The role of the teacher is also as a communicator, a friend who can give advice, motivator as an inspiration and encouragement, a guide in the development of attitudes and behavior and values to his students, is also a person who masters the material being taught ((Shaikh & Khoja, 2012). The teacher plays an important role in the learning process. Principally, the teachers, as a source of learning. The role of the teacher as a source of learning is related to the ability of teachers to master subject matter (Budiono, 2009). When students respond to the subject matter, the teacher will be able to answer directly in language that is easy to understand. The teacher acts as a facilitator in providing services to students to be able to facilitate students in receiving subject matter. So that learning becomes effective and efficient. The teacher acts as a manager to take full control of the climate in the learning atmosphere. The teacher is the captain who holds the ship's steering wheel, which leads the ship to the safe and comfortable road. The teacher must create a comfortable and conducive classroom atmosphere (Webb, 2009). So students can receive learning comfortably. The teacher acts as a demonstrator, which the teacher intended as a profile whose role is to show attitudes that will inspire students to do the same, even better. The teacher acts as a guide, the teacher is asked to be able to direct the students to be what they want. But of course, the teacher must guide and direct to be able to achieve the goals and dreams of these students (Lunenberg, Korthagen, & Swennen, 2007). The teacher also acts as a motivator for student learning. Students will get motivation in themselves to be passionate in everything (Budiono & Purba, 2020). Finally, the teacher acts as an elevator to the learning process, the teacher must evaluate all the results that have been made during the learning process. Thus each teacher's personal should always be given

awareness to prepare themselves in the field of readiness to use technology from time to time (J.T. Purba & Panday, 2015). This evaluation does not only evaluate the success of students in achieving learning goals. But also as an evaluation of the success of teachers implementing learning activities that have been designed (Lunenberg et al., (2007), Dobber, Zwart, Tanis, & van Oers, (2017)).

The role of a teacher cannot be replaced by high technology. Technology can indeed provide a variety of conveniences. But technology cannot provide character, value and moral education to students. So that only teachers who have an important role to be able to create the nation's young generation who have ethics, educated, moral, and character to produce leaders who are reliable in the future (Butar-Butar & Purba, 2015). So, the existence of teachers spread across all regions of Indonesia is a basic thing that must exist (Budiono & Purba, 2020). Teachers not only improve the condition of students but also improve their social environment (Seikkula-Leino, Ruskovaara, Ikavalko, Mattila, & Rytkola, 2010). Based on the description above, the problem in this study is to measure how far the influence of clean water and elementary teachers on GDRP in districts and cities throughout Indonesia is very urgent and give contributing thought based on data and research for the progress of this nation and also other countries that are likely similar.

3. Methodological Approach

Based on the problems and possible causal relationships between waiters with GDP and elementary teachers with GDRP, then we compile an economic model as outlined in the following figure.
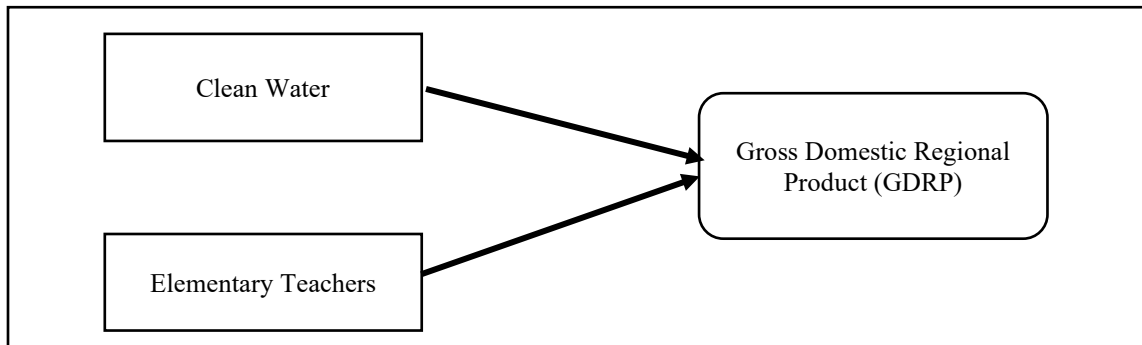
Figure 2. Economics Model.

Next, the analysis tools used are the econometrics and statistics methods to test the models and their respective parameters.

Based on the problems and possible causal relationships between water and GDRP and elementary teachers with GDRP, we are compiling an economic model. Next, the analysis tools used are the econometrics and statistical methods to test the model and their respective parameters (Greene, 2018). The unknown parameters of the stochastic relation $y_i = x_i'\beta + \varepsilon_i$ are the objects of estimation. It is necessary to distinguish between population quantities, such as β and ε_i, and sample estimates of them, denoted b and e_i. the population regression is $E[y_i|x_i] = x_i'\beta$, whereas authors estimates of $E[y_i|x_i]$ denoted

$$\hat{y}_i = x_i'\beta \tag{1}$$

The disturbance associated with the *i*th data point is

$$\varepsilon_i = y_i - x_i'\beta \tag{2}$$

For any value of b, we shall estimates ε_i with the residual

$$e_i = y_i - x_i'\beta \tag{3}$$

From the definitions, so The basic framework for analyzing cross section data is a regression model of the form (Greene, 2018)

$$y_i = x_i'\beta + \varepsilon_i = x_i'\beta + e_i \tag{4}$$

This study uses cross section data that includes in 501 districts & cities in Indonesia Territory. The purpose of this study is to analyze impact of availability of clean water (HH_W) and elementary teacher (EST) towards Income (GDRP without oil).

Based on the basic framework of this regression model, the applied regression model for this study is

$$GDRP = \beta_0 + \beta_1\, HH\_W + \beta_2\, EST \tag{5}$$

Subsequently a calculation is made by estimating the suitability of the econometric model that is the magnitude of the R-squared and F-test with a significance level of 5%.

Based on the theoretical estimates for each parameter to achieve the desired model conditions in mathematical equations are as follows;

$$\beta_1 = \frac{\partial GDRP}{\partial HH\_W} > 0 \quad \text{and} \quad \beta_2 = \frac{\partial GDRP}{\partial EST} > 0 \tag{6}$$

Based on the calculus equation, the partial test of each independent variable is one way. Clean water affects GDRP in the same direction, and Elementary Teachers also affect GDRP in the same direction. Thus, the value of each parameter β is expected to be positive.

While the partial testing of each independent variable on the dependent variable is carried out by t-test with a significance level in this study amounting to 5%.

By using the null hypothesis (H_0) and alternative hypothesis (H_1) for partial testing on the β_1 parameter as follows:

$H_0 : \beta_1 = 0$, availability of Clean Water does not affect revenue (GDRP)

$H_1 : \beta_1 > 0$, availability of Clean Water affects income (GDRP)

The null hypothesis (H_0) and the alternative hypothesis (H_1) for partial testing on the β_2 parameter are as follows

$H_0 : \beta_2 = 0$, the availability of elementary teachers does not affect income (GDRP).

$H_1 : \beta_2 > 0$, availability of elementary teachers influences income (GDRP).

The following is an explanation of the clean water, elementary teacher, and GDRP variables used in the economic model.

Table 1 Variables Description, Indicator, and Label

Variable	Indicator	Description	Label
Waters	Waters	The number of households that can access clean water in regencies and cities	HH_W
Elementary Teachers	Number of Elementary School Teachers	Number of elementary school teachers in districts and cities	EST
GDRP	GDRP	Real GDRP without oil in basic year 2010 in districts & municipalities	GDRP

Source: Selection of research variables

The clean water data is the number of household customers in public companies in clean water. The clean water in Indonesia means were managed by state companies or local governments that located those areas of regions. Number of elementary school teachers serving teaching activities in all districts and cities throughout Indonesia. The teacher plays a role not only in teaching but also provides important advice in the area of his social environment.

4. Result and Dicussion

Based on the proposed econometrics model, we conduct data processing in 501 observations (districts and cities) cross section. By using linear regression and robustness feasibility, the output of data processing is as follows.

Table 1. Result of Linear Regression for Real GDRP without Oil in Districts and Municipalities.

LINEAR REGRESSION				
Number of observation : 501				
F (2, 498) : 106.59				
Prob > F : 0.0000				
R-squared : 0.6561				
Root MSE : 1.7e+07				
GDRP	Coefficients	Robust Standard Error	t-test	P value > t
HH_W	176597.3	58217.43	3.03	0.003
EST	1347.857	100.6451	13.39	0.000

| Constant | -9429857 | 2695074 | -3.50 | 0.001 |

Source: processing data, 2020.

Based on the value of R-squared = 0.6567 shows that 65.67% changes in GDRP are influenced by independent variables in the model, while the influence of variables outside the model is only 34.33%. The test results for the proposed model that the results of the value of F-test = 106.59 and probability F = 0.00 smaller than the significance level of 5%, we reject the null hypothesis. The independent variable household access to water and elementary teacher simultaneously influence the GDRP in every city and district throughout Indonesia.

Based on the results of partial testing the HH_W variable is t-test = 3.03 and probability value t = 0.003 states that we reject null hyphotesis and accept alternative hypotheses. It is clear that household access to water (HH_W) significantly influences the GDRP in every district and city throughout Indonesia. Subsequent partial testing of the Elementary School Teacher (EST) variable. The results of t-test = 13.39 and probability value t = 0.000 states that we reject null hyphotesis and accept alternative hypotheses. It is clear that the existence of Elementary Teachers (EST) significantly influences the GDRP in every district and city throughout Indonesia. So testing together or partially shows the behavioral model in this study has met the statistically requirements.

Next, we construct the equation of the econometric model in this study as follows.

$$GDRP = -9429857 + 176597.3\, HH\_W + 1347.9\, EST$$

From the results equation it is clear that the existence of water and elementary teacher affects Real GDRP without oil as the foundation of the economy in Indonesia.

The second value of the parameter coefficient is positive, this shows the results of this study are in accordance with the hypotheses and theoretical basis. The magnitude of the parameter coefficient reflects the magnitude of the impact of the independent variable on the dependent variable. The value of clean water parameter with coefficient of 176.597 shows that each 1% increase in household access to water resulted in an increase of around 176.597 million rupiahs in each district and city throughout Indonesia. Likewise for the elementary teacher parameter coefficient of 1,348, it shows that an increase in one elementary teacher results in an increase of about 1,348 million rupiahs in every district and city in Indonesia.

The value of the clean water parameter coefficient is greater than the elementary teacher parameter coefficient, this shows that the impact of clean water on GDRP is greater than the elementary teacher. Clean water is a basic component for all activities in every social and economic sector as a whole. Whereas elementary teachers only affect the real GDRP only through human capital. Elementary teachers change human capital to be more productive.

Conclusion

Based on the description in the discussion and findings above, it is clear that the availability of water and elementary teachers has a positive effect on GDRP in 501 districts and cities spread throughout Indonesia. The existence of water in daily life activities has a very crucial role in all corners of Indonesia. So far, clean water is provided and managed by local government companies at low prices so that all households can access it. This case in Indonesia water is not only a basic need but also has a powerful function to improve the economic welfare of the people in every region in Indonesia. The value and benefits of water are not only powerful but also have a very large multiplier effect, so water is a key component for people's welfare.

What happens in Indonesia, Elementary teachers are placed at the elementary level and are widespread throughout the city as well as remote corners of the country. Elementary teachers are active human capital to move the environment around through powerful teaching, advice, and role models / examples. Everyone is motivated to pursue a better life. The role of elementary teachers is not only to improve the economy of the community but also to fight poverty. Because this elementary teacher has a powerful role and has a multiplier impact on welfare, the elementary teacher is the key to the economic prosperity of the Indonesian state. Thus, the government must focus on policies to increase the quantity and quality of elementary teachers in the regions.

The influence of clean water on community income is more dominant than the number of elementary teachers. This proves that water is more important and plays a fundamental role in all socio-economic activities compared to the existence of elementary teachers. However, the synergy of the availability of clean water and elementary teachers in all regions is the key to the success of the regional economy in Indonesia.

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