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THE INFLUENCES OF ECONOMIC AND SOCIAL INFRASTRUCTURE ON THE ECONOMIC GROWTH IN EASTERN INDONESIA

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ABSTRACT

The establishment of the public services between western and eastern Indonesia, especially in their public infrastructure and facilities, is still obviously uneven. Various public services such as health, education, clean water, and roads in eastern Indonesia are still far behind. The success level of national development can be measured through economic growth by comparing the aspects of local economic improvement to the quality and quantity of the infrastructure between the two regions. This study aims to analyze the influences of economic and social infrastructure on economic growth in Eastern Indonesia simultaneously and partially. This study was quantitative research utilizing panel data regression with Random Effect Model (REM) method. This study employed 96 observations consisting of annual time series data starting from 2010 to 2015 and cross-section data of 16 provinces in the Eastern Parts of Indonesia (KTI). The dependent variable was the economic growth measured by the Gross Regional Domestic Product or GRDP. Meanwhile, the independent variables were the road infrastructure, water infrastructure, electricity infrastructure, health infrastructure, education infrastructure, and labor. The coefficient values of the constant variables from the infrastructure of roads, water, electricity, health, education, and labor respectively were 3,8951-; 0,59706; -0,1395; 0,78033; 0,06913; and -0,8351. Based on the F testing result, the F-statistic probability value was 0.000, less than the significance level ($\alpha = 0.05$). All independent variables simultaneously affected the economic growth in Eastern Indonesia from 2010 up to 2015. The variables of road and clean water infrastructures partially had a positive and insignificant effect, whereas health and education infrastructures and labor had a somewhat positive and significant impact.

Key words: economic and social infrastructures, economic growth, national development

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1. INTRODUCTION

A high acceleration of economic growth would boost the national development of a country. In Indonesia, high economic growth is the main target of the economy due to the large population aggravated by a substantial proportion of people living below the poverty line since the early development of Repelita 1 in 1979 up to 1974. Economy growth plays an essential role as a short-term development priority [1]. However, comparing The western parts of Indonesia (KBI) to Eastern Indonesia (KTI), the development in Indonesia is still not evenly distributed. In terms of infrastructure and public facilities, the gap between these two areas is noticeable. Various public services in KTI, such as health, education, clean water, and roads, are still left behind KBI.

Economic growth, equity, quality of life, and environmental damage are the four indicators that serve as measuring rod and fundamental aspects for the success or failure of a country's development [2]. Economic growth is an indicator that can be used to measure a state or a region's achievement, which is beneficial in determining the course of future development. Positive economic growth shows an increase in the economy; on the other hand, negative economic growth shows a decline. As explained by Sukirno, [3], economic development is a business process in increasing per capita income or income of a country by processing economic potential into an original form. It could be done through five essential stages, i.e., investing, utilizing technology, gaining knowledge, managing skills, and improving organizational skills. Through these five stages, economic development can proceed and grow well.

One of the indicators that can be used to measure economic growth is the gross regional domestic product since this product is the amount of added value generated by all production activities in the economy. It means that the increase of the gross regional domestic product also reflects the remuneration for the production factors used in the production activities. In addition, the boundary for the GRDP calculation is the domestic area. It allows us to evaluate how capable economic policies adopted by the government in encouraging domestic economic activities.

Infrastructures are the leading indicator of national and regional development and economic growth. The development infrastructure provides its contribution to economic growth and the quality of people's life improvement [4]. Previous research stated that transportation infrastructure plays an essential role in the financial performance of a country [5] since this infrastructure positively influences the gross domestic product per capita or GDPPC. The influence of infrastructure towards life quality improvement is the consumption increasing value, labor productivity, employment availability, and people's lives prosperity. Infrastructures have a significant role in improving the economy of a region. At present, the government is still experiencing some obstacles in providing infrastructures, such as investment efficiency issues, limited funds, and the choice of priority scale. However, Eastern parts of Indonesia still require further analysis to determine whether infrastructure can increase economic growth or not. This study aims to determine the simultaneous and partial influence of economic and social infrastructures on economic growth in Eastern Indonesia.

2. METHODS

This study utilized a quantitative approach by analyzing the panel data regression econometric model. The dependent variable in this study was economic growth measured by GRDP. Whereas the independent variables were the infrastructure of roads, water, electricity, health, education, and labor. This research employed the secondary data obtained from the publications of the Indonesian Central Bureau of Statistics and the Indonesian Health Ministry. A literature study from books, economic journals, internet, and other relevant sources was conducted as a supporting discussion to complete this research explanation. The statistical analysis for the data collection was panel data regression, t-statistic test, F-statistic test, and coefficient of determination analysis.

3. RESULTS

Based on the study results, a descriptive analysis of each variable is explained in Table 1. It can be found in table 1 that the variable of labor has the highest mean value (439,0026), while the lowest mean value is in the health infrastructure variable (0,092396).

Table 1 The Descriptive analysis of each variable

	N	Minimum	Maximum	Mean	Std. Deviation
Economic growth	96	9316,79	414214,1	34354,82	47702,84951
road infrastructure	96	1,68920596	10,820425	4,88012	0,191703013
Clean water infrastructure	96	4,88012047	0,191703	45,14651	2,763615071
Electricity infrastructure	96	91,26	804,4	324,116	15,48167515
Health infrastructure	96	0,03688346	0,1965168	0,092396	0,003644218
Education infrastructure	96	0,80914342	2,2941653	1,283033	0,031273855
Labor	96	363,00893	539,78536	439,0026	3,563106626

The coefficient values on the panel data regression test (rem) can be observed in Table 2. The highest coefficient value is on the variable of labor (1,57087). If there were a 1 percent increase in labor, the economic growth in Eastern Indonesia would increase by 1,57087 percent.

Table 2 The result of panel data regression Random Effect Model

Variable	Coefficient	Std Error	t-Statistic	Prob
Constant	-3,8951	4,81101	-0,81	0,418
Road Infrastructure	0,59706	0,28249	2,11	0,035
Water Infrastructure	-0,1395	0,1224	-1,14	0,255
Electricity Infrastructure	0,78033	0,13753	5,67	0,000
Health Infrastructure	0,06913	0,2531	0,27	0,785
Education Infrastructure	-0,8351	0,32818	-2,54	0,011
Labor	1,57087	0,77154	2,04	0,042

The F test or simultaneous test was carried out to test the hypothesis. Based on the F test results, the F-statistic probability value was 0,000, less than the significance level ($\alpha = 0,05$). It indicated that the road, water, health, and education infrastructures, and labor significantly and simultaneously (coincide) influenced economic growth in Eastern Indonesia from 2010 up to 2015.

4. DISCUSSION

The results showed that simultaneously or coincidentally, the variables, i.e., the infrastructures of road, clean water, health, education, and labor, had a significant impact on the economic growth in Eastern Indonesia (KTI) from 2010 to 2015. This study was in line with the Neo-Classical (Solow-Swan) economic growth theory explaining that the growth of capital stock and labor influenced the number of goods and services output in a region or country. This study correlated with previous research [6,7].

Another variable that significantly influenced economic growth was road infrastructure, which also correlated with the previous study [7,8]. However, it contradicted the Neo-Classical (Solow-Swan) economic growth theory, which explained that various types of capital and capital stock growth affected the amount of output of goods and services in a region or country. Private companies invested in a standard form of equity while the government also spent in various types of public investment, such as the infrastructure of roads, clean water, health, and education. This study differed from the previous study's results, which examined the influence of infrastructure on economic growth in West Java from 2000 to 2007 [6]. The research indicated that road infrastructure had a positive impact on economic growth in West Java. However, it was not significant because, nowadays, the length of the road no longer functions as the primary support for establishing the economic aspect in Indonesia. The quantity and quality of the ways used widely in society today played an important role in the economic establishment. Different research areas were assumed to be the reason behind the differences found in these studies' results [6–8].

The result indicated that clean water infrastructure had a positive influence on economic growth in Eastern Indonesia from 2010 to 2015. Still, it was not significant due to the scarcity of freshwater and rising water rates in Eastern Indonesia. The study result was in line with the previous study [9], which examined the influences of clean water infrastructure on economic growth in Indonesia. Still, it was not significant enough because clean water infrastructure was no longer the only infrastructure that could increase economic growth. Another infrastructure that could also boost economic growth caused the amount of water in the area already scarce. This study was in line with the Neo-Classical (Solow-Swan) economic growth theory, which stated that the growth of capital stock affected the amount of output of goods and services in a region or country. However, other studies indicated that water infrastructure had a positive influence on economic growth in Indonesia from 2000 to 2007 because, by the improvement of water infrastructure, people could carry out various household activities that could increase economic growth [10].

On the other hand, electricity infrastructure had a positive and significant influence on economic growth in Eastern Indonesia from 2010 to 2015. It was because improving the health infrastructure would increase people's prosperity and ability to earn high incomes. This study was in line with the previous study, which explained that the variable infrastructure affected the economic growth in Bengkulu province in 1996-2008 [7] because electricity was valuable energy in the production process.

This study, supported by previous studies, suggested that health infrastructure had adverse and insignificant effects on economic growth in West Java. Health infrastructure and the growth of development had nothing to do with one another because the improvement of health infrastructure caused pricy treatments and hospitalization, and complicate people with low income in West Java to access health services in hospitals [6]. However, this result contradicted the Neo-Classical (Solow-Swan) economic growth theory, which explained that capital growth affected the amount of output. In other words, when health infrastructure increased, economic growth would also increase. Private companies invested in a standard

form of capital while on the other hand, the government invested in various forms of public capital infrastructure such as roads, clean water, health, and education.

Education infrastructure showed a positive and significant impact on economic growth in Eastern Indonesia from 2010 to 2015. Increasing the number of educational infrastructure units was an effort to boost economic growth. Education infrastructures and economic growth were hands in hand because people obtained knowledge and increased their income by leveling their education. As a result, the level of growth and welfare also increased.

Labors had positive and significant growth towards the economic growth in Eastern Indonesia from 2010 to 2015 because the employment availability in an area could increase the number of workers and economic growth[11]. This study was in line with previous studies examining the influences of labor on economic growth [6,10]. The study results stated that the labor force had a positive and significant effect on economic growth. It indicated that the Indonesian economy was more labor-intensive rather than capital intensive[12-13-14].

Based on the results above, the government could increase the economic growth in Eastern Indonesia by upgrading the roads, electricity, and education infrastructures. In addition, the government could also increase the workforce by enhancing the level of labor force participation in Eastern Indonesia.

5. CONCLUSION

Roads infrastructures, clean water infrastructures, electricity infrastructures, health infrastructures, education infrastructures, and labor simultaneously have a significant influence on economic growth in Eastern Indonesia (KTI) from 2010 up to 2015. However, the clean water infrastructure variable partially has negative and insignificant impacts on economic growth. While the health infrastructure has somewhat positive and insignificant influences. The education infrastructure variable partly has negative and significant influences. In contrast, the road infrastructure, electricity infrastructure, and labor have partially positive and significant impacts on economic growth in Eastern Indonesia (KTI) from 2010 up to 2015.

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