www.bircu-journal.com/index.php/birci
Budapest International Research and Critics Institute-Journal (BIRCI-Journal)
Humanities and Social Sciences
ISSN 2615-3076 Online)
ISSN 2615-1715 (Print)
Budapest Institute

Capital Expenditure and Investment on Economic Growth in West Papua Province 2015-2019

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Abstract

This study was conducted to know the effect of capital expenditure and investment on economic growth in West Papua in 2015-2019. First, sampling was carried out using the saturated sampling technique with the number of samples obtained in 13 districts/cities. Panel data with Least Square Dummy Variable (SLDV) model estimation is used as an analysis method and Stata 16 functions as a data processing program. The research then found that the capital expenditure variable had a negative and insignificant effect on economic growth. Then it was found that the investment variable has a positive and significant impact on economic growth. Compared with the results of studies using only independent variables, the use of control variables (population and average length of schooling) will present the most significant coefficient of determination at the time of full regression. These results then indicate that the control variable has a strong influence on economic growth.

Keywords
capital expenditure; investment; population, average length of schooling; economic growth

I. Introduction

Economic activities that have additional income in a certain period can be described through economic growth. Thus, the economic development's success can be measured through the economic growth that occurs in an area (Demurger, 2001). Economic growth is still an important goal in a country's economy, especially for developing countries like Indonesia (Magdalena, 2020).

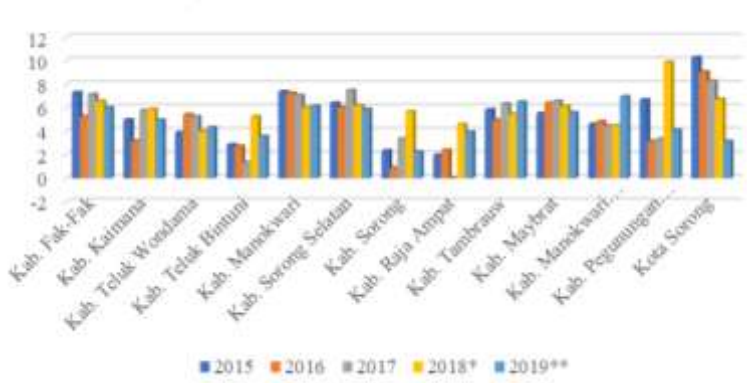

Figure 1. *Economic Growth in West Papua Province*

It can be seen through Picture 1 regarding economic growth in West Papua Province. Economic growth that occurs in West Papua fluctuates. Throughout the research time, there is a gap in the numbers obtained. Some districts/cities have high economic growth, while some other districts/cities have low economic growth. Even in 2017, there were negative

slope numbers obtained by Kab. Raja Ampat with a number of -001, this is very concerning considering that Raja Ampat is a tourist destination in West Papua Province (Anggoro, 2016). Then, the only municipality, namely Sorong City, obtained unsatisfactory results and experienced reverse growth, where economic growth in Sorong City continued to decline from year to year.

According to the Ministry of Finance's Directorate General of Treasury, economic development in West Papua Province is a must that must be realized immediately because it has a strong relationship with the achievement of national development targets (Lubis, 2020). In addition, economic development in West Papua Province has a reasonably high impact on the eastern parts of Indonesia (Sukwika, 2018). Here are some problems related to the condition of the people of West Papua Province:

- There are still high disparities between regions and inadequate quality of infrastructure, both roads, electricity, and other life support facilities (Fourie, 2006).
- The low level of education of the workforce. Most of the population has a relatively low average length of schooling. In addition, the people still have a low literacy rate. Therefore, it can be concluded that there are still people who cannot read and write (Wößmann, 2003).
- The crime rate is relatively high due to security disturbances carried out by separatist groups who want Papua Island to be independent (Malawat, 2020).
- Difficult people's lives result from the rapidly increasing population but are not matched by improved infrastructure conditions (Sjafii, 2009).
- Health facilities have not reached all levels of society, such as the uneven distribution of hospitals and the distribution of medical personnel in districts/cities in West Papua Province.

These problems can be solved through economic growth. The capital formation can be carried out to increase economic growth in a region (Badri, 2016).

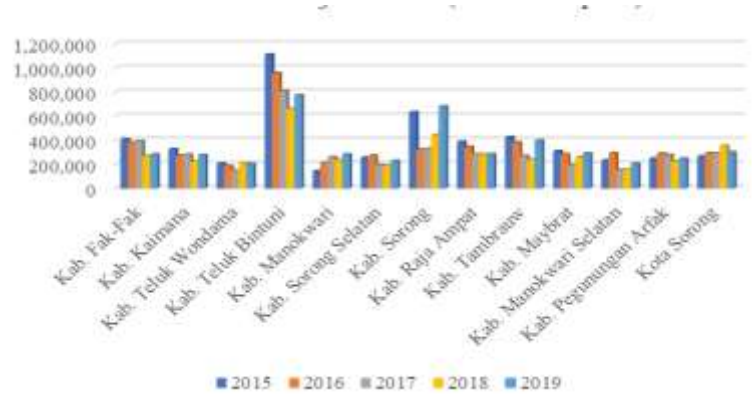

Figure 2. *Fluctuations in the Realization of District/City Capital Expenditures in West Papua Province during the 2015-2019 Period*

Meanwhile, capital expenditures carried out by other regencies/cities in 2019 are not far apart, with a range of between 200-300 billion rupiah. Bado stated that activities in government capital expenditures in South Sulawesi Province have a reasonably positive and significant impact on economic growth in the area (Bado, 2015). Meanwhile, Yunus and Amirullah's research gave different results, namely that capital expenditure activities carried out by the district governments in Aceh Province influenced economic growth, but this was not significant (Yunus & Amirullah, 2019). Such situation enables the country to achieve economic growth with higher inflation. (Teshome in Wollie, 2018).

Capital spending is not the only determinant of economic growth. Another factor influencing economic growth is the formation of gross fixed capital (PMBT). PMBT can be seen through the investment process (Runtunuwu & Kotib, 2021). The economic development of a region will cause changes in the role of each sector resulting in changes in the economic structure of the area (Irwansyah in Lubis, 2020).

Figure 3. *The Development of the Realization of Gross Fixed Capital Formation Investment (PMTB) in West Papua Province during the 2015-2019 Period*

The picture above shows the development of the realization of gross fixed capital formation investment (PMTB) in West Papua Province during the 2015-2019 period. Each year the highest percentage was obtained by Kab. Manokwari, one of which was in 2019 where the realization of PMTB investment in Kab. Manokwari reached 42.32% with a high level of realization. This means that Kab. Manokwari is still the primary choice of investment location, considering its status as the capital city of West Papua Province. Bado, through his research, explains that there is a negative and significant influence on economic growth in South Sulawesi Province (Bado, 2015). Then research from Kartikasari shows a positive and significant impact of investment on economic growth in the Riau Islands. From the explanation above, the researcher wants to test and analyze the effect of capital expenditure and investment on economic growth in the 2015-2019 period (Kartikasari, 2017).

II. Review of Literatures

2.1 Economic Growth

Sukirno argues that economic growth can be interpreted as a form of development in economic activities. This activity then takes place from time to time until real national income is developed (Sukirno, 2012). Gross Domestic Product (GDP) is one element of national income. The market value that is successfully generated from various goods and services during a specific period in an economy is GDP (Rounaghi, 2019).

Four approaches classify theories in economic growth according to Todaro and Smith. These approaches include the following:

a. The Linear Stage of the Growth Model

1) Walt W. Rostow - Stages of Growth, in The Stages of Economic Growth, this theory identifies the sequence of community development, namely: the category of traditional society; prerequisite categories take off to self-sustaining growth; takeoff category; category of drive to maturity; high mass consumption category (Rostow, 1990).
2) Harrod-Domar – Growth Model, this theory says that investment is the key to economic growth (Anwar & Sun, 2011).

b. Theories and Patterns of Structural Change

1) Lewis theory – Wage determination and investment patterns in the modern sector are discussed in this theory (Blecker, 2021).

c. The International Dependence Revolution

1) Neo-colonial dependency model, in the international capitalist system, this model attempts to link underdeveloped countries to the historical evolution of international relations, which has an imbalance between rich and developing countries (Deng et al, 2021).
2) False paradigm model, through policies that are made and can influence leaders and policymakers in developing countries. This model will then try to link developed countries with developing countries (Weerakkody et al, 2021).
3) The dualistic development thesis, this thesis sees the world as divided into two relatively large groups, namely the group containing the rich countries and the group containing the developing countries (Nagirikandalage et al, 2020).

d. The Neoclassical, Free-Market- Counterrevolution

1) Robert Solow – neoclassical growth model, this theory provides the opinion that developments in the factors of production can be a benchmark in seeing existing economic growth (Todaro & Smith, 2012).

2.2 Capital Expenditure

According to the Ministry of Finance, in Appendix III of the Regulation of the Minister of Finance No. 101/PMK.02/2011 concerning budget classification, "Capital expenditure is an expenditure to pay for the acquisition of assets or add value to fixed assets or other assets that provide benefits for more than one accounting period and exceed the minimum capitalization limit of fixed assets or other assets set by the government. Capital expenditures have several uses in the form of capital expenditures for land, equipment, and machinery, buildings and buildings, roads and irrigation and networks, and capital expenditures for Public Service Agencies (BLU) (Khoirudin et al, 2021).

2.3 Investment

Mankiw argues that various expenditures carried out to buy multiple capital goods and production equipment can be interpreted as a form of investment in economic theory. The purchase of capital goods and production equipment is then carried out in the hope of replacing and adding various capital goods that will later be used to produce goods and services in the future (Mankiw, 2013). Thus, Gross Fixed Capital Formation (GFCF) can serve to describe investment. In the statistical reference information system, the Central Statistics Agency (BPS) explains that PMTB is an expenditure for capital goods with a service life of more than one year and are not consumer goods (Zulmasyhur, 2018). The GFCF includes residential and non-residential and non-residential buildings, other buildings such as roads and airports, and machinery and equipment (Paprotny, 2020). Capital expenditures for military purposes are not covered in this detail but are classified as government consumption.

Investment activities have three functions, namely:

- Components are derived from the aggregate expenditure. This will then lead to an increase in aggregate demand, employment, and national income if there is an increase in investment
- The increase in production capacity caused by the rise in goods and capital
- Technological developments faster (Dwiningwarni, 2011)

2.4 Relationship between Research Variables

a. The Relationship between Economic Growth and Capital Expenditures

Capital expenditures are often used to carry out infrastructure development in economic growth. This is because in production activities, the need for infrastructure is critical. This can influence economic growth, both direct and indirect effects (Wang et al, 2020). Bado, in his research, shows that the government carries out a positive and significant influence through capital expenditures on economic growth in South Sulawesi. Bado then concluded that the high productivity of the regional economy is directly proportional to the high capital expenditure. This is because capital expenditures for infrastructure and public services will positively impact economic growth (Bado, 2015).

But Yunus and Amirullah provide another conclusion from their research. His study concluded that capital expenditure influences economic growth, but this is not significant. This is because the implementation and budgeting for capital expenditures take time in the realization process. This then hinders the process of economic growth because people need time to be able to improve their economy (Yunus & Amirullah, 2019).

b. The Relationship between Investment and Economic Growth

In general, the government carries out investment activities with the aim of capital expenditure to support people's lives (Serrano & Kazda, 2020). Through his research, Kartikasari argues that investment activities positively and significantly influence the economic growth in the Riau Islands. This is because investment activities will increase productivity, which in the long term will also boost economic growth (Kartikasari, 2017). However, in another study, Bado found that there was a significant and negative effect in South Sulawesi on growth as a result of investment activities. Bado believes that this negative influence is caused by investment activities that are not well-targeted. This is based on empirical data obtained in the 2001-2013 study. In this study, it is known that the distribution of investment is still unequal between districts and cities (Bado, 2015).

III. Research Methods

West Papua Province is the object of this research, with capital expenditure and investment as independent variables and population and the average length of schooling as control variables. The data to be used is secondary data sourced from the BPS and APBD websites. This study will use panel data regression as an analytical method through a combination of cross-section data and time-series data in 13 districts/cities in West Papua Province in the 2015-2019 time period. STATA 16 program will be used in conducting data analysis.

IV. Discussion

4.1 Testing and Model Selection

The best estimation model chosen is the Fixed Effect model, but when the feasibility test of the model with the Fixed Effect model is known that H_0 is accepted or the model that will be used for this research is not fit with the data so that a fully modified fixed effect is carried out by using the least square dummy variable (LSDV) model estimate, where a time effect is added that takes into account the impact of the time series during 2010-2015.

4.2 Model Feasibility Test
F Test

Table 1. F Test Results

No control variable		
Prob > F	**F-count**	**F-table**
0.00	6.24	2.53
With control variable		
Prob > F	**F-count**	**F-table**
0.00	4.66	2.53

It can be seen from the table above if without entering the control variable, it is known that the value of Prob > F is 0.00, or it can also be written as 0.00 < 0.05. Then the F-count value and F-table value can be compared, where in this case the F-count is 6.24 and the F-table is 2.53 or F-count > F-table. Through this comparison, we can conclude that the model used in this study fits the data. The same result is also obtained if entering the control variable, it is known that the value of Prob > F is 0.00 or it can also be written as 0.00 < 0.05. Then the F-count value and F-table value can be compared, where in this case the F-count is 4.66 and the F-table is 2.53 or F-count > F-table. We can conclude that adding a model control variable to this study will fit the data through this comparison.

4.3 Coefficient of Determination (R^2)

The results of the coefficient of determination from the research-tested without including the control variable obtained an R-square of 0.28 or 28%. This can be interpreted as 28% of the economic growth variables can be explained, while other variables will explain the remaining 72% outside of this study. Meanwhile, if tested by including the control variable, it will obtain an R-square of 0.30 or 30%. This can be interpreted as 30% of the variable economic growth can be explained, while other variables will explain the remaining 70% outside of this study.

4.4 Classic Assumption Test
a. Normality Test

Table 2. Normality Test Results

Shapiro-Wilk W test for normal data					
Variable	**Obs**	**W**	**V**	**z**	**Prob>z**
Residual	65	0.97	1.83	1.31	0.09

Through the table above, it can be obtained that the Prob>Z value is 0.09 or 0.09> 0.05. Therefore, this can be interpreted that the existing data can be distributed normally.

b. Multicollinearity Test

Table 3. Multicollinearity Test Results

Variable	VIF	1/VIF
BM	**1.35**	**0.74**
INV	**1.52**	**0.66**
logPOP	**4.59**	**0.22**
logRLS	**4.42**	**0.23**
Mean VIF	**2.97**	

Through the table above, it can be found that the Tolerance (1/VIF) value of all variables is more than 0.10. Then it was found that all Variance Inflation Factor (VIF) values were smaller than 10. This could mean that there were no symptoms of multicollinearity between the independent and control variables through the regression model.

c. Heteroscedasticity Test

Table 4. Heteroscedasticity Test Results

Modified Wald test	
Prob>chi2	0.00

Through the table above, it can be seen that the value of Prob>Chi2 is 0.00 or .0.00 < 0.05. This can then be interpreted that there is a heteroscedasticity problem in this study.

d. Autocorrelation Test

Table 5. Autocorrelation Test Results

Wooldridge test	
Prob > F	0.37

Through the table above, it can be found that the value of Prob>F is 0.37 or 0.37> 0.05. This can then be interpreted that there is no autocorrelation problem found in this study.

4.5 Panel Data Regression

This study uses Robust Standard Error as a treatment to fix or overcome the problem of not Blue as a result of the detection of Heteroscedasticity problems. The regression model with the inclusion of control variables in this study resulted in 8 equations, including the following:

$GR_{it} = 8.65 - 0.09BM_{it} + U_{it}$ ..... (1)

$GR_{it} = 3.39 + 0.07INV_{it} + U_{it}$ ..... (2)

$GR_{it} = -0.00 + 0.50log\_POP_{it} + U_{it}$ ..... (3)

$GR_{it} = 3.66 + 0.89log\_RLS_{it} + U_{it}$ ..... (4)

$GR_{it} = 3.43 - 0.00BM_{it} + 0.07INV_{it} + U_{it}$ ..... (5)

$GR_{it} = 3.54 - 0.00BM_{it} + 0.07INV_{it} - 0.01log\_POP_{it} + U_{it}$ ..... (6)

$GR_{it} = 4.88 - 0.00BM_{it} + 0.08INV_{it} - 0.83log\_RLS_{it} + U_{it}$ ..... (7)

$GR_{it} = 1.31 - 0.00BM_{it} + 0.07INV_{it} + 0.75log\_POP_{it} - 3.11log\_RLS_{it} + U_{it}$ ..... (8)

Table 6. Results of Panel Data Regression

Variable	Dependent Variable: Economic Growth							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Cons	8.65	3.39	-0.00	3.66	3.43	3.54	4.88	1.31
BM	-0.09 (0.03)				-0.00 (0.04)	-0.00 (0.04)	-0.00 (0.04)	-0.00 (0.04)
INV		0.07 (0.01)			0.07 (0.02)	0.07 (0.02)	0.08 (0.02)	0.07 (0.02)
log_POP			0.50 (0.36)			-0.01 (0.37)		0.75 (0.62)
log_RLS				0.89 (1.45)			-0.83 (1.51)	-3.11 (2.49)
Obs	65	65	65	65	65	65	65	65
R-square	0.13	0.28	0.08	0.05	0.28	0.28	0. 29	0.30

The regression equation model at the time of full regression by including the control variable is:

$$\mathbf{GR_{it} = 1.31 - 0.00BM_{it} + 0.07INV_{it} + 0.75log\_POP_{it} - 3.11log\_RLS_{it} + U_{it}}$$

Explanation:

GR = Economic growth
BM = Capital Expenditure
INV = Investment
POP = Total population
RLS = Average Length of School

4.6 Hypothesis Test (Uji T)

Table 7. T-test Results

With control variable			No control variable		
Variable	P>|t|	t	Variable	P>|t|	t
BM	0.99	-0.02	BM	0.98	-0.02
INV	0.00	3.23	INV	0.00	3.23

Capital expenditures tested with control variables obtained P>|t| of 0.99 and without the control variable obtained P>|t| of 0.98 (P>|t| >). By comparing the value of t_{count} as much as -0.02 and t_{table} as much as 1.67 ($t_{count} < t_{table}$), it can be concluded that with or without

including control variables, the variable of capital expenditure has an effect on economic growth, but this effect is not significant. Therefore hypothesis H_0 can be accepted while H_1 is rejected.

Investments tested with or without control variables obtain P>|t| of 0.00 (P>|t| <). By comparing t_{count} as much as 3.23 and t_{table} as much as 1.67 ($t_{count} > t_{table}$) it can be concluded that with or without including control variables, investment variables have a significant impact on economic growth. Therefore hypothesis H_0 is rejected while H_2 is accepted.

4.7 Analysis

a. Effect of Capital Expenditure on Economic Growth

Through the study results, it can be found that with or without including the control variable, the capital expenditure variable has a negative and insignificant effect on economic growth. These results follow the research conducted by Yunus and Amirullah. In their study, they found that economic growth was influenced by capital expenditure, but not significantly. Meanwhile, research conducted by Bado showed the opposite result. On the contrary, Bado found a positive effect of capital expenditure on economic growth with a significant nature.

Table 8. Budget and Realization of District/City Capital Expenditures in Prov. West Papua in 2019

District/City	Budget	Realization	%
Fak-Fak District	228.758	283.55	123,95 %
Kaimana District	268.772	277.123	103,11 %
Teluk Wondama District	208.137	203.172	97,61 %
Teluk Bintuni District	752.325	774.32	102,92 %
Manokwari District	299.364	283.487	94,70 %
South Sorong District	272.017	229.655	84,43 %
Sorong District	717.728	682.13	95,04 %
Raja Ampat District	295.213	285.84	96,82 %
Tambrauw District	550.903	397.885	72,22 %
Maybrat District	306.634	292.037	95,24 %
South Manokwari District	184.529	206.044	111,66 %
Pegunungan Arfak District	312.121	249.599	79,97 %
Sorong City	224.759	300.83	133,85 %

Based on the table above, this result is probably because when compared with the realization level, it can be seen that the significant allocation of capital expenditures is not accompanied by an optimal level of realization, with a relatively large proportion of capital expenditures not being able to support increased economic growth due to the lack of effectiveness in managing capital expenditures. According to the 2019 Regional Fiscal Study, the highest amount of capital expenditure was given to the Ministry of Public Works and Public Housing and the Ministry of Transportation during that year. The capital expenditure is then used in West Papua Province to build infrastructure. The infrastructure built includes projects in the form of bridges, reservoirs, irrigation, trans-Papua roads, and the construction of houses for TNI soldiers.

b. The Effect of Investment on Economic Growth

Through the study results, it can be found that with or without including control variables, the investment variable has a positive and significant effect on economic growth. This result is in line with the results of Kartikasari's research, which found a positive effect of capital expenditure on economic growth and is positive. Therefore, Kartikasari believes that through investment, economic growth can be increased in the long term. This is because investment can increase productivity that occurs in society. But, of course, the investment carried out must be efficient to enjoy the economy's growth prospects.

However, this is different from the research conducted by Bado. In his study, it was found that there was a negative and significant effect of investment on economic growth. Bado believes that the emergence of this negative influence is caused by investment activities carried out without hitting the right target. In general, the positive cause of investment is the increase in production capacity through investment. This can then affect the increase in people's income. Therefore, it is often stated that investment can boost economic growth.

V. Conclusion

Through the various analyzes above, it can be found that there is a negative and insignificant effect of capital expenditure on economic growth that occurred in West Papua Province during the period 2015 to 2019. The effect did not change with the presence of the control variable. Then it was also found that there was a positive effect of investment on economic growth in West Papua Province during the period 2015 to 2019. This effect did not change with the presence of the control variable.

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