Paper Technical Efficiency of Infrastructure Spending Nexus Unemployment of District/ Municipalities in Province of Jambi

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Abstract

This research investigates determine the level of technical efficiency of Infastructure spending in districts/ municipalities and its effect on economic growth of Jambi Province at periode 2013 to 2017. Using 2 (two) research methods, Data Envelopment Analysis (DEA) with VRS optimization and output oriented to answer the first research objective, which is trying to measure technical efficiency of local government (the most efficient local government is considered to have 100% efficiency) as a reference from all DMUs being compared. The output variables are the percentage of steady roads, electrification ratios and community access to clean water (chosen as the Government's Main Performance Indicator in infrastructure) with infrastructure expenditure (local government infrastructure spending plus provincial infrastructure spending in each regencies/ municipalities plus infrastructure spending from state budget in each regencies/municipalities). Regression using OLS to answer the second research objective is to determine the effect of the technical efficiency of infrastructure spending on unemployment in regencies/municipality in Jambi Province. The result show that the technical efficiency of infrastructure spending has a significant effect on unemployment of regencies/municipality in Jambi Province, its reduce unemployment.

Technical Efficiency, DEA, OLS, Public Finance, unemployment

1. Introduction

Jambi Province is one of the provinces in Indonesia which has an area of 53,435 Km2, with a land area of 50,160.05 Km2 and a water area of 3274.95 Km2. The population is spread across 9 (nine) districts and 2 (two) cities, which in 2017 amounted to 3,515,017 people. The size of the infrastructure budget shows how much priority the Government has on infrastructure development in the region. The increase in the amount of budget and the percentage of infrastructure spending towards State spending in the last 5 (five) years and with the stipulation of infrastructure spending as one of the mandatory spending since 2017 (amounting to 25% of the Transfer Funds obtained by the Regional Government), will more or less have an impact on policy finance and infrastructure conditions in Jambi Province.

1.1 Infrastructur Spending

In order to find out how much local government infrastructure spending is in Jambi Province, the following will be presented in Figure 1. The infrastructure spending data used is the ratio of realized district /city infrastructure spending, realized provincial infrastructure spending in each district / city, DAK[1] infrastructure spending that is derived from the APBD[2] in each district / city towards the realization of regional expenditure.

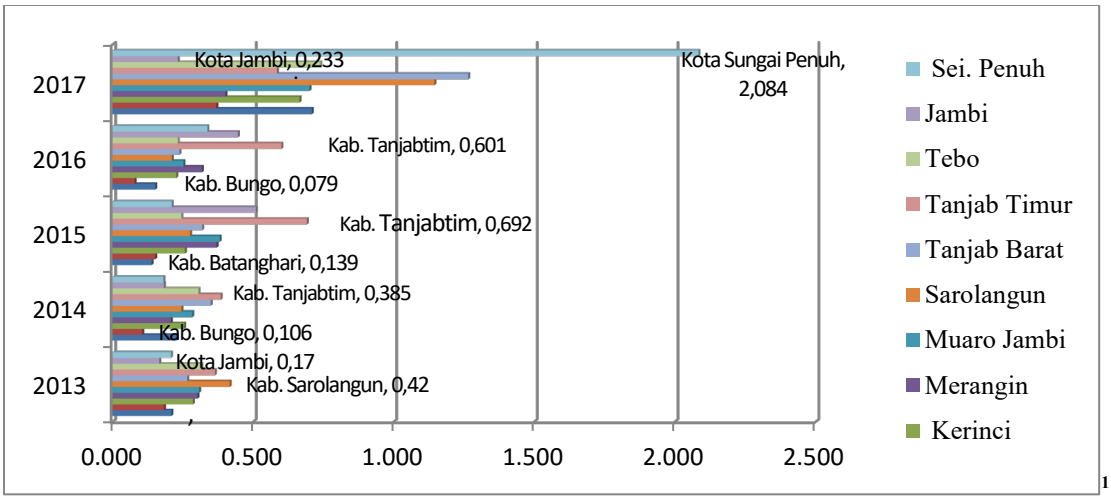

Figure 1. Ratio of Infrastructure Expenditure to Regional Expenditure in Districts / Cities as well as in Jambi Province 2013-2017

Based on Figure 1, during the period 2013-2017, it shows that the portion of Infrastructure Expenditures fluctuated in each Regency / City. In 2013, Jambi City had the lowest ratio of infrastructure spending at 0.17 to total regional spending, while Sarolangun District had the highest portion of infrastructure spending at 0.42. Tanjung Jabung Timur Regency has the highest ratio of infrastructure spending to regional spending for 3 (three) consecutive years, namely 2014,2015 and 2016. During the study period, the lowest ratio of infrastructure spending to regional spending was owned by Bungo Regency in 2016 which was only 0.079. In 2017, almost all local governments experienced an increase in the ratio of infrastructure spending to regional spending. This is due to the policy to increase infrastructure spending carried out by the Central Government so that at the end of the research period it has increased to 400.9 trillion or an increase of 275% compared to the beginning of the research period. In addition, it is also supported by policies that make infrastructure spending one of the mandatory spending in addition to education and health, with a policy of 25% of the transfer funds obtained by each Regional Government. So that the ratio of realization of infrastructure shopping to regional expenditure for Sungai Penuh City in 2017 reaches 2.08 due to the large amount of infrastructure spending realized from DAK[1] infrastructure that exceeds the realization of expenditure in the Sungai Penuh City APBD[2] itself.

The performance quality of a budget can be seen from its output and outcome. Some of the Main Performance Indicators used in the assessment of the achievement of several strategic goals for infrastructure development in an area include the percentage of steady roads (calculated from the length of roads in good and moderate condition divided by the number of road lengths) be it district roads, provincial roads or state roads, the electrification ratio. (comparison between the number of household heads who have used electricity to the total number of household heads in an area) and community access to clean water (ratio between the number of household heads who have access to proper drinking water and the number of all household heads in the area). The initial conditions regarding the relationship between infrastructure spending growth and infrastructure quality growth as seen from the indicator of the percentage of steady roads, indicators of access to clean water and indicators of electrification ratio, can be seen in Figure 2 below.

[1] DAK is allocating the State Revenue and Expenditure Budget to certain provinces/regencies/cities to fund special activities, which are the affairs of the Regional Government and following national priorities. DAK is included in the Balancing Fund, in addition to the General Allocation Fund

[2] APBD (National Revenues and Expenditures Budget) is the annual financial plan of the Government of Indonesia approved by the House of Representatives. The APBN contains a systematic and detailed list that contains plans for state revenues and expenditures for one fiscal year

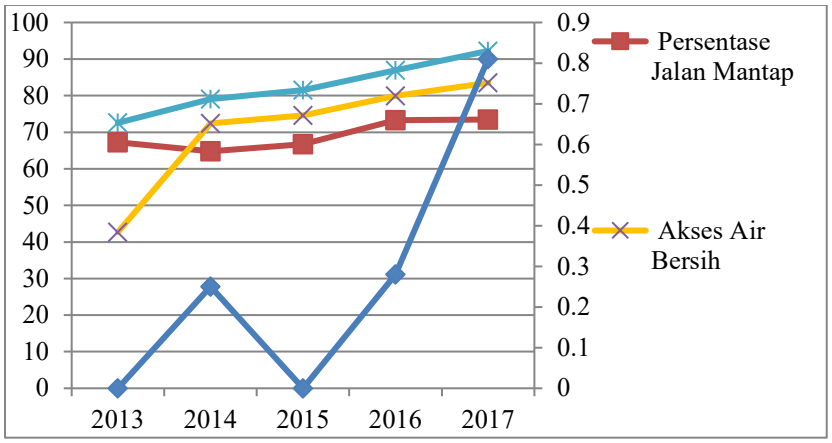

Figure 2. Growth of Average Infrastructure Expenditure Ratio to Regional Expenditure, Percentage Growth of Steady Road Length, Growth of Access to Clean Water and Growth of the Electrification Ratio of Jambi Province in 2014-2017

Based on Figure 2, access to clean water and the electrification ratio always experienced progressive growth during the study period, while infrastructure spending and the percentage of steady road lengths fluctuated. Infrastructure spending experienced a decline in 2014 and 2016. In 2017, infrastructure spending experienced the highest growth. In 2014, when the average ratio of infrastructure spending to regional spending in Jambi Province decreased by 10.71%, steady roads also decreased by 3% but public access to clean water grew by 69.5% and the electrification ratio grew by 8.95 %. In 2017, the average ratio of infrastructure spending experienced the highest growth of 189.29%, steady roads grew by 3.13%, public access to clean water grew by 4.5% and the electrification ratio grew by 6.13%. However, the growth in infrastructure spending in 2017 did not automatically boost the growth in the percentage of steady roads, growth in access to clean water and growth in the electrification ratio.

1.2 Unemployment Rate

The conditions for the open unemployment rate in districts / cities in Jambi Province can be seen in Table 1. below:

Table 1. Regency / Municipal Open Unemployment Rate in Jambi Province 2013-2017

Area	Year				
	2013	2014	2015	2016	2017
Jambi Province	*4,84*	*5,08*	*4,34*	*4*	*3,87*
Batang Hari District	5,94	5,69	3,38	4	3,57
Bungo District	4,38	6,34	2,98	4,65	4,89
Kerinci District	7,13	4,44	3,67	4	3,26
Merangin District	6,01	2,55	5,38	4,51	4,1
Muaro Jambi District	2,78	4,36	5,4	4,48	5,39
Sarolangun District	3,64	4,13	4,53	3,64	2,25
Tanjung Jabung Barat District	4,9	1,34	2,68	2,68	3,07
Tanjung Jabung Timur District	3,53	1,73	1,44	2,27	2,36
Tebo District	0,73	3,86	1,94	2,13	1,98
Jambi City	7,44	10,13	7,32	7,61	5,55
Sungai Penuh City	5,12	10,81	8,18	7,06	4,14

Source : Jambi Province and Regency / City in Figures 2014-2018

= the highest score

= lowest value

Based on Table 1, during the research period, the highest open unemployment rate in Jambi Province occurred in 2014 with an index of 5.08. Sungai Penuh City has the highest contribution of 10.81 and Tanjung Jabung Barat Regency is the district with the lowest open unemployment rate, namely 1.34. The lowest open unemployment rate in Jambi Province occurred in 2017 at 3.87 with the largest contribution from Jambi City at 5.55 and the lowest contribution from Tebo Regency at 1.98.

Dynamic economic development will cause the unemployment rate to always arise but this can be prevented by increasing government spending and cutting taxes (Battaglini & Coate, 2016). Government spending on infrastructure has attracted a lot of attention because of its potential to stimulate all economic activity and also create job opportunities (Kenyon, 1997). Infrastructure has an important role in reducing transaction costs, reducing disparities between regions, alleviating poverty and also accelerating economic growth, according to Schwab in The Global Competitiveness Report (2015). In the short term, the infrastructure expenditure incurred by the Government to build physical infrastructure can open up job opportunities, thereby reducing the open unemployment rate. In addition, better infrastructure can increase labor mobility so that workers have the ability to move to places where the workforce is very limited. Based on research results from Leigh & Neill (2011), increased government spending on road construction has reduced the local unemployment rate in Australia. However, it is different from the research by Burton A. Abrams (1999) on the G7 countries which concluded that an increase in the percentage of government spending to GDP has increased unemployment.

There are several studies conducted specifically to analyze the efficiency of government spending. Herrera and Ouedraogo (2018) conducted research on the efficiency of government spending in the fields of education, health and infrastructure for 175 countries in the world using the Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH) methods, the results show that there is a negative relationship between efficiency. and the level of government spending. The variables of inequality, urbanization and the level of openness have a mixed relationship, some are positive and some are negative for the level of efficiency. The efficiency of capital spending is positively related to the quality of government and negatively related to perceptions of corruption.

Chan & Karim (2012), conducted research on the efficiency of public spending (spending in the fields of administration, education, health and infrastructure) among countries in East Asia and other selected countries using the DEA method and the Tobit regression, the result was that the more stable a country's politics was. the more efficient government spending and the efficiency of public spending can be used as indicators to evaluate the effectiveness of the implementation of government policies in the infrastructure, administration, education, health, income distribution and economic stability sectors.

This research will try to measure the technical efficiency of district / city infrastructure spending in Jambi Province and try to find out how it affects economic growth in Jambi Province.

3. Method

The DEA method is used in this study to determine the level of technical efficiency of district / city government infrastructure spending in Jambi Province. According to Charnes, Cooper & Rhodes (1978), DEA is a program based on mathematics to calculate the level of relative efficiency by using multiple inputs to produce multiple outputs from decision-making units (DMUs).

DEA with VRS optimization is used in this study which assumes that the operating scale of a DMU is not optimal or not yet optimal. Another assumption of this model is that the ratio between added inputs is not the same as the ratio of added output. Likewise, in the implementation of government programs, the addition of input to additional output is unlikely to have the same addition ratio. There are many factors that affect output, such as: inflation, domestic and global economic conditions, social conditions, political conditions, regional conditions (geographic location, land structure, access to locations, etc.), quality of human resources, government size, conditions of defense. and safety and other factors.

The output orientation was chosen in this study because the Government uses a performance-based budgeting system and efficiency in achieving the intended performance is directed at the efficiency of the output and outcome of a program / activity because the amount of input has been allocated by the Regional Government in the APBD. The mathematical model in this study uses the DEA Variable Return to Scale (VRS) method with the output orientation in accordance with the formula used by Coelli (2016) namely the model used to calculate efficiency, namely:

$Max\ _{\phi\lambda}\phi,$…… (3.1)
with limitations:
$-\phi y_{it} + Y\lambda \geq 0$……..……..…. (3.2)
$x_{it} - X\lambda \geq 0$ ……. (3.3)
$N1'\ \lambda\ = 1$ …… (3.4)
$\lambda \geq 0$ …… (3.5)
Where:

Y	:	*Output*
X	:	*Input*
$N1'\ \lambda\ = 1$	:	The convexity limit is used to ensure that the DMU is determined by the same measure
θ	:	Technical efficiency score (TE) which has a value between 0 to 1

[2]The implementation of fiscal decentralization in Indonesia has resulted in the existence of existing infrastructure in Jambi Province as a manifestation of the results of infrastructure spending whose funds come from the APBN[3], Provincial APBD and district / city APBD[2]. Many studies on infrastructure spending use infrastructure spending data which only comes from the State Revenue and Expenditure Budget (APBN[3]) or the Regional Budget (APBD[2]) only. In this study, we try to use infrastructure spending data from these three funding sources. The use of input to the ratio of infrastructure spending to total government expenditure refers to research by Afonso, Schuknecht and Tanzi (2010), Afonso and Aubyn (2005) and Chan & Karim (2012).

The outcomes used in this study were the percentage of steady road length, electrification ratio and community access to clean water. This selection is based on the three outcomes above are the main performance indicators of the government in the infrastructure sector. In addition, the use of a variable percentage of steady roads is based on research by Merini (2013). The electrification ratio is based on the research of Herrera & Pang (2005). Meanwhile, the use of variable public access to clean water is based on research by Merini (2013).

In order to answer the second research objective, namely to determine the effect of technical efficiency in infrastructure spending on district / municipal unemployment in Jambi Province, the OLS method is used. Based on the economic growth model developed by Barro (1990) which adopts the Cobb Douglas production function:

$$Y_{it} = K_{it}^{\alpha} L_{it}^{\beta} G_{it}^{Y} \quad \ldots\ldots (3.6)$$

Where Yit is total output or GRDP, Kit is Capital, Lit is labor and Git is government expenditure. The subscripts i and t represent districts and times. According to Agenor (2010) and Rahmayanti and Horn (2011), the impact of government spending (G) is not only on the amount of money spent, but is also influenced by the efficiency of spending. So G_it depends on the amount of expenditure (E) and Efficiency (Eff):

$$G = G\ (E, eff) \quad \ldots\ldots (3.7)$$

The basic equation can be rewritten as follows:

$$Y_{it} = K_{it}^{\alpha} L_{it}^{\beta} G(E, eff)_{it}^{Y} \quad \ldots\ldots (3.8)$$

To see the effect of Technical Efficiency on Infrastructure Spending on economic growth, adjusting the Angelopoulos (2008) model in Rahmayanti and Horn (2011), the equation is modified to:

$$TPT_{it} = \alpha_1 + \beta_1 INF * eff_{it} + X_{it}\beta + \varepsilon_{it} \quad \ldots\ldots (3.9)$$

[3] APBN is Anggaran Pendapatan dan Belanja Nasional (National Revenues and Expenditures Budget) is the annual financial plan of the Government of Indonesia approved by the House of Representatives. The APBN contains a systematic and detailed list that contains plans for state revenues and expenditures for one fiscal year

[3]Where INF is infrastructure spending and Effit is the technical efficiency score. Infrastructure spending is obtained from the results of DEA processing and X_it is another control variable that affects economic growth. According to [4 5]Agenor (2010), the multiplication of efficiency levels with government infrastructure spending represents the government's physical capital stock. simplifies the form of the variable INF *eff _, then this variable is here in after referred to as the Effinf variable. So that the form of the equation becomes:

$TPT_{it} = \alpha_3 + \beta_8 EffINF_{it} + \beta_9 RLS_{it} + \beta_{10} LnKREDIT_{it} + \varepsilon_{it}$ ..... *(3.10)*

Based on the data, there is one hypothesis that will be tested in this study, namely the technical efficiency of infrastructure spending is thought to reduce unemployment. Panel data used in this study are secondary data for 5 (five) years (2013-2017) from the Jambi Representative Financial Audit Board Regional Finance Agency, data on infrastructure spending sourced from the State Budget from the Ministry of Finance, data the Electrification Ratio from ESDM[4] Office, data on access to clean water from the Health Office and other macroeconomic data such as data on economic growth, basic infrastructure conditions and GRDP were obtained from Central Bureau Of Statistics Jambi Province.

4. Data Collection

Based on the source, this study uses secondary data. Secondary data is data obtained by researchers indirectly through intermediary media, which consists of:

1. Studies sourced from supporting journals and literature reviews.
2. Data on the total infrastructure spending of 11 (eleven) districts / cities and Jambi Province from the 2013-2017 time period from the Regional Finance Agency, data on infrastructure spending sourced from the State Revenue and Expenditure Budget and the Special Allocation Fund from the Ministry of Finance, data on the Electrification Ratio from the Energy and Mineral Resources Office, data on access to clean water from the Health Office and other macroeconomic data such as data on economic growth, basic infrastructure conditions, GRDP, unemployment rate, population, obtained from the Jambi Province Central Bureau of Statistics.

5. Discussion

5.1 Technical Efficiency with Optimization of Return to Scale and Output Oriented Variables

Efficiency is the ability of the DMU to minimize the input used in producing output vectors or the ability to produce maximum output from a given input (Kumbhakar & Lovell, 2003). So that the DMU can be fully technically efficient if it produces maximum output by using a fixed input level (output orientation) ((Setiawan et al., 2012)). The limited budget owned by the Government makes the DMU unable to operate at an optimal scale, so that is the reason for the use of the Variable Return to Scale. Technical Efficiency Value ranges from 0 to 1. DMU is said to be efficient if the value of technical efficiency = 1. DMU that has technical efficiency = 1 is a DMU which based on the DEA measurement results has the most optimal comparison between output combinations using existing inputs compared to other DMUs being compared. Then the results of measuring the technical efficiency of the DMUs that are considered the most efficient will form a frontier and become a reference for the assessment of technical efficiency for other DMUs being compared, because the most efficient DMUs are considered 100% efficient.

This research was conducted on the use of infrastructure spending in 11 (Eleven) districts / cities in Jambi Province for a period of 5 (five) years from 2013 to 2017. Data processing was carried out by combining all districts / cities in 5 (five) years to form 55 (Five) years. Fifty-five) DMU which is measured as 1 (one) year, with the aim that the efficiency value from the initial year of the research period to the final year has the same benchmarks. So that the result is possible that the DMU which has an efficiency score of = 1 does not occur in every year of the study. Data processing was carried out using DEAP 2.1 software to determine the level of technical efficiency of district / city infrastructure spending in Jambi Province, with input variables for infrastructure spending and output of steady road length (%), electrification ratio (%) and community access to clean water (%) can be seen in Table 2 below:

Table 2: Technical Efficiency Measurement Results for Output Orientation Infrastructure Expenditures Using DEA 2013-2017

District/ City	Year				
	2013	2014	2015	2016	2017
Batang Hari District	0,559	0,802	0,858	0,881	0,831
Bungo District	0,710	0,842	0,982	1	0,976
Kerinci District	0,552	0,864	0,875	0,918	0,925
Merangin District	0,930	0,787	0,831	0,896	0,896
Muaro Jambi District	0,792	0,908	0,949	0,969	0,966
Sarolangun District	0,781	0,868	0,870	0,921	0,946
Tanjung Jabung Barat District	0,853	0,931	0,950	0,958	0,973
Tanjung Jabung Timur District	0,791	0,847	0,863	0,886	0,805
Tebo District	0,783	0,864	0,843	0,916	0,946
Jambi City	0,984	1	0,975	0,998	1
Sungai Penuh City	0,995	1	0,929	1	1
Average	*0,788*	*0,871*	*0,883*	*0,90*	*0,914*

Source: Processed data

Based on Table 2, the average technical efficiency of infrastructure spending during the study period has always experienced a progressive increase. However, if you can see the Technical Efficiency scores in each district / city always fluctuate during the study period, only Kerinci, Sarolangun and Tanjung Jabung Barat districts have always experienced an increase compared to the previous year. In addition, there is not a single district / city in Jambi Province which annually has the most efficient technical efficiency (ET = 1) throughout the research period.

Kerinci Regency in 2013 had the lowest technical efficiency with an efficiency value = 0.552, this means that Kerinci Regency was relatively inefficient in 2013, which was only able to exploit 55.2% of its production potential. To be efficient, Kerinci Regency must increase its output by 44.8% (100% -55.2%). In 2014, Merangin Regency had the lowest technical efficiency with an efficiency score of 0.787, which means that Merangin Regency was relatively inefficient, only being able to exploit 78.7% of its production potential. To be efficient, Merangin District must increase its output by 21.3% (100% -78.7%). Merangin Regency again had the lowest technical efficiency in 2015, with a technical efficiency score of 0.831, which means that Merangin Regency is relatively inefficient. To be efficient, Merangin Regency must increase its output by 16.9% (100% -83.1%), because it is only able to exploit 83.1% of its production potential. In 2016, Batanghari Regency had the lowest technical efficiency score, which was 0.881, which means that it is relatively inefficient because it is only able to exploit 88.1% of its production potential. So that in order to be efficient, Batanghari Regency must increase its output by 11.9% (100% -88.1%). In 2017, Tanjung Jabung Timur Regency had the lowest technical efficiency score with a score of 0.805 which means it is relatively inefficient because it is only able to exploit 80.5% of its production potential. So that in order to be efficient, it must increase its output by 19.5% (100% -80.5%). Jambi City in 2014, River City in 2014, Bungo Regency in 2016, Sungai Penuh City in 2016, Jambi City in 2017 and Sungai Penuh City in 2017 are relatively efficient compared to other districts / cities being compared because they have an efficiency score of 1 or 100% (capable of exploiting 100% of its production potential). So that the six districts / cities become peers or guidelines to increase efficiency for other districts / cities.

In the context of the research, it can be concluded that districts / cities that have an efficiency level of = 1 are able to use infrastructure spending optimally compared to other districts / cities. If you look at the results of the output of DEAP 2.1, only Bungo district in 2016 has not experienced decreasing returns to scale, that is, with limited inputs it is able to produce optimal output. Five other districts / cities that have Technical Efficiency = 1 experience decreasing returns to scale, but because the DEA method used is output-oriented, the one with the maximum combination of output and a certain input weight will have Technical efficiency = 1.

Many studies have examined the shape of the relationship between the amount of government expenditure on the efficiency score and have produced varying conclusions. Several studies have found a negative relationship between the amount of expenditure and the efficiency score, such as research from Gupta & Verhoeven (2001)), (Jayasuriya & Queintein (2012), Afonso et.al (2005) and Herrera-Pang (2005). While others find that the efficiency score has a positive relationship to the amount of government spending such as research from Evans et.al (2003) and others find that there is no significant impact like the research of Filmer and Pritchett (1999).

5.2 Effect of Technical Efficiency of Infrastructure Spending on Unemployment Rate

From the results of the classical assumption test carried out on the model, it can be concluded that the model does not experience heteroscedasticity problems and autocorrelation problems but has multicollinearity problems. However, if the independent variables used are significant and do not interfere with the model and the sign of the coefficient of each independent variable is considered in accordance with economic theory or empirically proven, then the multicollinearity problem can be ignored. So that the final model uses a random effect with the following estimation results:

Table 3. Estimation Results of Infrastructure Expenditure Efficiency (EFFINF), Loans extended by banks (LnKREDIT) and Average Years of Schooling (RLS) to the Open Unemployment Rate (TPT)

Variable	Estimation Results	
EFFINF	-1,7 (0,58)	 ***
LnKREDIT	-0,36 (0,19)	 ***
RLS	1,33 (0,20)	 *
R^2	0,85	
Prob > chi2	0,00	

Source: Processed data
*Information : * Significant at a critical value of 10%*
***Significant at a critical value of 5%*
**** Significant at a critical value of 1%*

Based on Table 3, it can be concluded that the independent variable is able to explain the dependent variable by 85% ceteris paribus and the coefficient of -1.709 is explained, which means that each increase in the efficiency of infrastructure spending (EFFINF) by 1 (one) unit will reduce the open unemployment rate (TPT) by 1 (one) unit. 1,709 units assuming other variables ceteris paribus.

These results are in accordance with economic theory as well as the results of previous studies from Monacelli et al (2010), Mayer et al (2010), Kuo and Miyamoto (2014) and Leigh and Neill (2011). The credit variable issued by banks in Jambi Province (LnKREDIT) significantly affects the Open Unemployment Rate in Jambi Province at a critical value of 1%. The coefficient is -0.36, which means that every 1 (one) percent increase in credit issued by the banking sector will reduce the open unemployment rate by 0.36 ceteris paribus units.

The results of this study are in line with the results of research in general, Feldman (2012) conducted a study on the effect of bank credit in 53 (Fifty Three) countries for the 1977-2005 period using the Two Stage Generalized Least Square method and concluded that an increase in the amount of bank credit by 1% would reduce the unemployment rate by 2.94%. According to Lipsey et al (1994), an increase in the amount of credit from the banking sector will increase investment and consumption expenditure which in turn increases the labor ratio. Lending from banks will increase household consumption expenditure and encourage companies to increase production, investment and increase employment (Pagano and Pica, 2012).

The variable average length of schooling (RLS) significantly affects the Open Unemployment Rate in Jambi Province at a critical value of 10%. The coefficient is 1.33, which means that every 1 (one) unit increase in the average length of schooling will further increase the open unemployment rate by 1.33 ceteris paribus units.

This is reinforced by the data on the open unemployment rate in Jambi Province at the end of the study period, where the number of open unemployment based on the highest education attained has the following composition; No / never attended school, as many as 0 people; No / not yet graduated from elementary school as many as 3,581; SD as many as 7,691 people; 10,223 SMP; SMA as many as 26,102 people; SMK as many as 9,343 people; Diploma as many as 2,374 people and universities as many as 7,502 people (BPS Jambi Province 2018). So based on these data the number of unemployed is actually dominated by the population who has the highest SMA followed by SMK. However, when viewed based on the percentage of the number of graduates at each level, the highest open unemployment came from SMK at 7.5% of the total number of SMK graduates, followed by SMA at 7.2% of the total SMA and University graduates by 5% of all. the number of residents who are scholars.

There are several things that cause this condition to occur. First, the condition of districts / cities in Jambi Province, which is mostly still agricultural. So that most of the people's livelihoods still depend on the agricultural sector in a broad sense. So that the existing job offers have not been able to absorb labor based on the level of education, causing the number of open unemployed to be dominated by people who have a high level of education. In addition, the inadequate condition of infrastructure facilities such as steady roads, which percentage at the end of the study period was 69.782%, making information and mobilization of residents in areas with higher job offers also hampered due to the difficulty of information and transportation to get out of their places of residence.

The results of this study are in line with the results of a study by Erdem and Tugcu (2012), who concluded that the higher the level of education completed is one of the factors that lead to increasing unemployment in Turkey in the long run. The average old school has also increased the unemployment rate in the short term although its influence is relatively small. Added by the research results of Manaseer and Al Qudah (2018) that the output of higher education levels in Jordan has a positive and significant influence on the unemployment rate in Jordan.

6. Conclusions and Suggestions

6.1 Conclusion

Based on the analysis carried out on the research results and the discussion, which refers to the research objectives, the following conclusions can be drawn:

1. The technical efficiency score has a value that fluctuates every year, and there is no single local government that every year always has a technical efficiency = 1 (TE = 1) throughout the study period.
2. Technical efficiency of district / city infrastructure spending in jambi province has a significant effect on the unemployment rate in jambi province, which is able to reduce the unemployment rate. This result is in accordance with the predetermined hypothesis. Likewise, economic growth significantly reduces the unemployment rate.

6.2 Suggestion

a. In the future, further research is needed on measuring the technical efficiency of infrastructure spending by using multi-input and multi-output, with a larger scope.
b. In the future, further research is needed on the effect of technical efficiency of infrastructure spending on the economy by using other determinants that are not discussed in this study.
c. In the future, it is necessary to conduct research by also measuring the efficiency of the allocation and the economic efficiency of infrastructure spending and to determine the effect on the economy.

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