Determinants of economic growth regencies/cities in Jambi Province with dynamic panel data approach

Hajri Puja Pratama[*]; Syaparuddin; Emilia

Development Economics Study Program, Faculty of Economics and Business, Universitas Jambi, Indonesia

[*] *To whom correspondence should be addressed: email: hajripujaprtm14@gmail.com*

Abstract

This study aims to analyze the determinants of economic growth Regency/City in Jambi Province. The factors considered to be the determinants of economic growth are lagged economic growth, government expenditure, household consumption, labor, and infrastructure. This study used time series data from 2011-2020 and cross-section 11 regencies/cities in Jambi province. The analysis tool used in this study is dynamic panel data regression. The results of the dynamic panel data regression show the generalized system method of the moment model as the best model. Based on the analysis results, lagged economic growth had a significant positive effect. In the short term, labor had a significant negative effect, and infrastructure had a significant positive effect. In contrast, government expenditure and household consumption did not significantly affect economic growth. In the long run, infrastructure has a significant positive effect, while government expenditure, labor, and home consumption have no significant effect on economic growth.
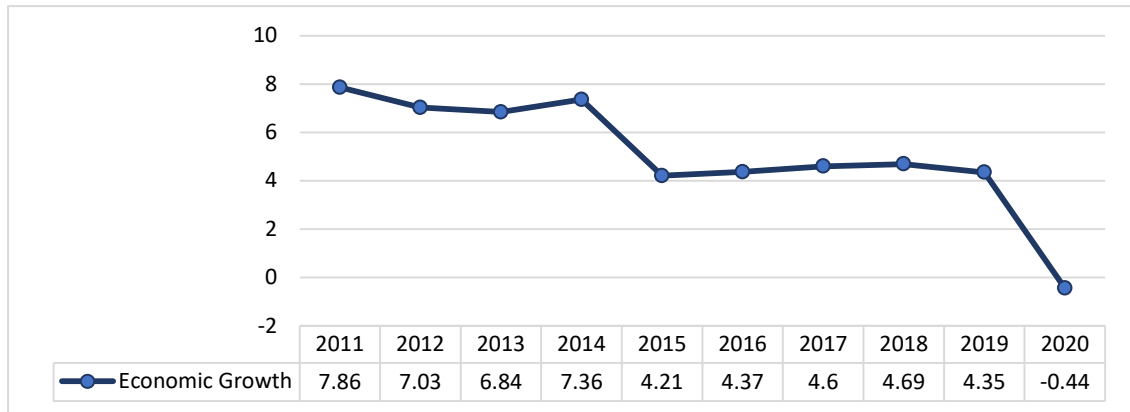
Keywords: Dynamic panel data, Economic growth, Government expenditure, Household consumption,

JEL Classification: O47, R11, R15

INTRODUCTION

Development is a prolonged process to achieve the goal of improving the welfare of the community. Therefore, a mandatory development strategy can spur economic development and improve the quality of human resources. Based on these development goals and strategies, the implementation of development must be shown on things that can improve mutual welfare. Efforts are needed for increased economic growth and income equality so that the level of public welfare increases (Boediono, 2009).

A rise in a nation's wealth brought on by producing products and services from one era to the next is known as economic growth (Burlando & Tartaglia, 2018). The rate of increase in a country's gross domestic product (GDP) is one of the most commonly used measures of economic growth or wealth expansion (Petrakis, 2020). Meanwhile, able to see and find out the rate of economic growth in an area can be used with the value of the gross regional domestic product (GRDP); besides that, the use of this GRDP value can see the economic conditions in an area at a certain period. This GRDP value can explain the ability of regions to use or manage existing resources; the potential of one region with other regions is not the same (Rahman, 2015).

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Economic Growth	7.86	7.03	6.84	7.36	4.21	4.37	4.6	4.69	4.35	-0.44

Source : BPS Jambi Province, 2022
Figure 1. Economic growth Jambi Province

Based on data from BPS, the economic growth of Jambi Province from 2011-2020 tends to decrease. Economic growth in 2011 was 7.86%; in 2012, it decreased to 7.03%, the decline occurred again in 2013 to 6.84%, and in 2015 to 4.21% lower than the previous year, the decline occurred again in 2019 to 4.35% and in 2020 to -0.44%. In 2020 the economy of Jambi Province contracted; this contraction occurred due to limited economic activities and the lack of recovery of society mobility fully entering the new normal due to the Covid-19 pandemic (BPS, 2020).

The central and local governments have made various efforts to accelerate development (Syaparuddin et al., 2019), one of which is a policy through government expenditure. According to Keynes, the government can either directly or indirectly control the economy with its spending policies, providing a wide range of public goods and facility services. Then Keynes was of the view that the government could reverse the case of an economic recession by increasing incomes and re-circulating them through different spending programs. With this, a multiplier effect is created due to increased consumer demand. It will stimulate investment, thus causing the economy to move on the path of expansion for endogenous growth models (Joshua, 2019).

Keynes's theory focuses on aggregate spending as important in increasing economic growth. Keynes argues that one thing that affects economic activity is household consumption expenditure Kocka in (Tapparan, 2020). In the short term, household consumption can affect the rise and fall of economic activity. In addition, household consumption in the long term has a major effect on economic growth (Halim, 2018).

The expansion of the economy has historically been one of the positive factors that have economic growth of the population or population and the growth that occurs in the labor force. The larger the population, the larger the domestic market. A large number of the working-age population with expert skills and skills and with a high level of education will be able to potentially increase the productivity and output of an area (Todaro & Smith, 2012).

Effective infrastructure also facilitates economies of scale in the production process, integrates markets, develops business prospects, and reduces transportation and production costs through timely delivery, all of which contribute to the desired economic growth. Additionally, connecting rural areas to growing hubs through the construction of roads, trade, investment, and access to goods and services may be expanded in previously disconnected regions; therefore, infrastructure has a substantial multiplier effect (Mohmand et al., 2016).

Economic problems are generally dynamic variables, meaning those that affect variables can be influenced by other variables and the variables themselves in the previous period. In the context of this study, it is suspected that previous economic growth could affect current economic growth. Based on data from BPS, the economic growth of Jambi Province from 2011-2020 tends to decrease. In the same year, government spending, household consumption, labor, and road infrastructure, have increased yearly.

This phenomenon shows that there is a gap between theory and reality. According to the theory of government spending, household consumption expenditure, labor, and road infrastructure can drive the economy, but in reality, this is not the case. Based on these conditions, it is necessary to have further identification so that the research carried out has a clear scope.

METHODS

This study used secondary data from time series during the 2011-2020 period and cross sections of 11 regencies/cities in Jambi Province. The data used were economic growth, government expenditure, household consumption, labor, and infrastructure. The data was sourced from the Central Statistics Agency of Jambi Province and the Directorate General of Finance Balance.

To answer the purpose of the study, namely analyzing the determinants of economic growth using dynamic panel data regression with two-step estimates. This research uses dynamic panel data because, in static panel data, there is an endogeneity problem; if estimated, it will produce biased and inconsistent estimators (Juanda & Junaidi, 2012). Therefore, this study uses dynamic panel data because the resulting estimate does not contain bias and consistency when using lagged dependent variables.

There are two approaches in dynamic panel data models: First Different GMM and System GMM. Blundel & Bond (Baltagi, 2005) state that the First Different GMM (FD GMM) estimator can contain bias and inaccuracy if the sample is small. Blundel and bond suggest using the System Generalized Method of Moment (SYS GMM) model, which is claimed to be more efficient regarding short-time series data. This study will use one of the best models of dynamic panel data with a two-step estimator for the general model of estimating the dynamic panel data equation of the First Different GMM model and the System GMM model, as follows (Baltagi, 2005):

$$Y_{it} = \delta Y_{it-1} + \beta_1 X_{it} + e_{it} \quad ....(1)$$

Furthermore, the estimation model of the FD GMM equation and the SYS GMM is changed as follows:

1. Equation estimation model with two-step estimator in a short time :

$$EG_{it} = \beta_0 + \beta_1 EG_{it-1} + \beta_2 GE_{2it} + \beta_3 HC_{3it} + \beta_4 L_{4it} + \beta_5 INF_{5it} + e_{it} ....(2)$$

2. Equation estimation model with two-step estimator in the long :

$$EG_{it} = \beta_1 GE_{1it} + \beta_2 HC_{2it} + \beta_3 L_{3it} + \beta_4 INF_{4it} + e_{it} ....(3)$$

Keterangan   :
EG   : Economic growth
EG$_{-1}$: Lagged Economic growth
GE   : Government expenditure
HC   : Household consumption
L   : Labor
INF   : Infrastructure

β_0 : Constants
$\beta_1, \beta_2, \beta_3$: Regression coefficient
i   : Individual (1,2,3…n)
t   : Time (1,2,3…n)
ei   : Eror term

Model specification test

Best model selection

The best model was selected to determine the best model between the two models in the dynamic panel data used in this study. To find out can be seen from the model whether the estimator contains bias or impreciseness, if one of the models contains bias, then the other model is the best and most appropriate to use. The unbiased estimator can be seen from the value of the coefficient-lagged dependent variable of the FD GMM or SYS GMM model. By comparing the value coefficient lagged dependent variable of the SYS GMM model, the model is not biased if the lagged dependent variable of the FD GMM or SYS GMM model is between the lagged variable dependent of the FEM model and the PLS model.

Sargan test

Sargan tests are performed to see or ensure that the instrument variables used are valid, the number of which is more than the number of estimated parameters (overidentifying conditions). The test was performed by comparing the prob chi-square or p-value value with alpha = 5%. If the p-value > alpha, it can be concluded that the instrument variable is valid, and if the p-value < alpha, then the instrument variable is invalid.

Arellano-Bond test

The Arellano-bond test is carried out to see the results of the estimated obtained consistency or not consistency; with this, it can see whether there is a correlation between one residual component and another residual component in the GMM System model. This test compares the value of prob z or the p-value of order 2 with alpha = 5%. If the p-value > alpha, then there is no autocorrelation. If the p-value < alpha, then there is an autocorrelation indicating that the resulting estimate is inconsistent.

Z test

The z-test is performed to see whether or not there is a partial influence of independent variables on dependent variables. Testing can be done by comparing prob z with alpha = 5%. If prob z < alpha, then the independent variable partially has a significant effect on the dependent variable, and vice versa (Gujarati, 2012).

Wald test

This wald test was carried out to see whether or not there was a simultaneous influence of independent variables on dependent variables. If the prob chi-square or p-value value < alpha, the independent variable simultaneously significantly affects the dependent variable and vice versa.

RESULTS AND DISCUSSION

Descriptive statistics

Based on macroeconomic aspects, the average economic growth during 2011-2020 was 5.4%, with the highest economic growth of 9.74% in Bungo Regency in 2011, while the lowest economic growth of -3.87% occurred in Tanjung Jabung Timur Regency in 2020.

Table 1. Descriptive statistics

Variable	Maximum	Minimum	Mean	Annual Growth Rate (%)
Economic growth	9.74	-3.87	5.4	-17.2
Government expenditure	1702.41	403.65	1024.65	9.3
Household consumption	12,061.80	1,551.35	5,128.54	3.7
Labor	286.387	35,842	141.098	2.2
Infrastructure	261.69	17.11	92.67	-5.3

Then the average government expenditure is 1024.65 billion rupiahs, with annual growth of 9.3%. The most government expenditure was 1702.41 billion rupiahs, namely the government expenditure of Tanjung Jabung Barat Regency in 2019. The high government expenditure was due to the increase in original local income, which included taxes, levies, and other legitimate income, then due to the increase in balance funds allocated to the government in Jambi Province. While the least government expenditure was Merangin Regency in 2011 amounted to 403.65 billion rupiahs.

Furthermore, the highest household consumption occurred in Jambi City in 2019 at 12,061.80 billion rupiahs. The high household consumption is inseparable from the increasing number of producers who innovate to meet the community's needs, then because of the influence of E-commerce because it can make it easier for people to transact and get what they need. While the lowest household consumption occurred in Sungai Penuh City in 2011, amounting to 1,551.35 billion rupiahs. The average household consumption is 5,128.54 billion rupiahs, with annual growth of 3.7%.

The most labor occurred in Jambi City in 2019, as many as 286,387 people, and the large labor is due to a large amount of incoming investment of 192,908.3 billion rupiah, which has an impact on a large number of workers absorbed. At the same time, the least labor occurred in Sungai Penuh City in 2013 as many as 35,842 people. The average workforce is 141,098, with annual growth of 2.2%.

Road infrastructure with good condition occurred the most in Merangin Regency in 2015 at 261.69 kilometers. This increase is due to the large number of projects aimed at improving road infrastructure as a form of government attention in infrastructure development to attract the attention of domestic and foreign investors. The development of infrastructure in an area can be used as the main capital to increase economic growth. At the same time, road infrastructure with good condition occurred the least in Full River City in 2018 at 17.11 kilometers. Road length infrastructure with the good condition has an average of 92.67 kilometers, with annual growth of -5.3%.

Model specifications test

In this study, we will look for the best model among the two models in the dynamic panel data that will be used in this study. To find out, it can be seen from the estimator model that it contains bias or is imprecise. If one of the models contains bias, then the other model is the best and right to use. The results of the FEM, FD GMM, SYS GMM, and PLS models can be obtained and can be seen in Table 2.

Table 2. Model estimation FEM, FD GMM, SYS GMM, and PLS

Variable	FEM	FD GMM	SYS GMM	PLS
C	10.486007	12.271009	6.146755	1.5683888
EG_{t-1}	0.3723041	0.31675317	0.5019464	0.67559438
GE	0.00106063	0.00280801	0.0011873	-0.00110503
HC	-0.0004462	-0.00166697	-0.0004462	0.00009739
L	-0.00002505	-0.00003825	-0.0141216	-7.705e-06
INF	-0.0199886	0.01274951	0.0141216	0.01298034

Based on Table 2, the value of the FEM model's lagged dependent variable coefficient is 0.37230341. The value of the lagged dependent variable coefficient of the FD GMM model is 0.316753, the lagged dependent variable of the SYS GMM model is 0.50194639, and the value of the PLS model lagged dependent variable coefficient is 0.67559435. In this case, the lagged dependent variable of the FD GMM model is below the lagged dependent variable of the FEM model, which indicates that the estimate obtained by the FD GMM model contains bias and inaccuracies.

Then the value of the lagged dependent variable coefficient is 0.5019464. This indicates that the coefficient lagged dependent variable of the SYS GMM model is between the value of the lagged coefficient lagged dependent variable of the FEM and PLS models. It can be concluded that the SYS GMM model estimation results have accuracy and do not contain bias. Therefore, the best model used in this study is the SYS GMM (System Generalized Method of Moment) model.

Sargan test

To find out and ensure that the instrument variables used are valid, a Sargan test can be carried out, for the results of the Sargan test can be seen in Table 3.

Table 3. Sargan test

Chi-Square	Prob.
9.809211	1.0000

Based on Table 3, a prob chi-square value of 1,000 is obtained, and it can be seen that prob chi-square is greater than alpha (5%). It can be concluded that the instrument variable does not correlate with an error, indicating that the instrument variable is valid.

Arellano-Bond test

In using dynamic panel data regression, the estimation results obtained must be consistent to determine if an Arellano-bond test can be carried out. The results of the Arellano-bond test can be seen in Table 4.

Table 4. Arellano-Bond test

Order	z-Statistics	Prob.
1	9.809211	0.0274
2	1.0000	0.4775

Based on Table 4 obtained the value of prob z in the 2nd order of 0.4775. It can be seen that prob z is greater than that of alpha (5%). So it can be concluded that there is no autocorrelation in the first difference error in the 2nd order so that it can be ascertained that the resulting estimate has been consistent.

The SYS GMM model estimation in the short term

Based on the results of processed data obtained, estimates of the influence of lagged economic growth and the influence of government expenditure, household consumption, labor, and infrastructure on economic growth in the short term can be seen in Table 5.

Table 5. Short-term SYS GMM model esimation

Variable	Coefficient	Std.Error	z-Statistics	Prob.
C	6.146755	2.481152	2.48	0.013
EG_{t-1}	0.5019464	0.1936762	2.59	0.010
GE	0.0011873	0.0014936	0.79	0.427
HC	-0.0004462	0.0004642	-0.96	0.336
L	-0.0141216	7.62e-06	-4.28	0.000
INF	0.0141216	0.0041375	3.41	0.001

Z test

The z-test was performed to partially determine the independent variable's effect on the dependent variable. Based on table 5, the lagged economic growth variable obtained a coefficient of 0.50194639, a statistical prob z of 0.010 < 0.05(alpha). It can be concluded that the lagged growth partially had a positive and significant effect on economic growth.

The government expenditure variable obtained a coefficient of 0.0011873, the statistical prob z of 0.427 > 0.05 (alpha). In the short term, government expenditure partially has no significant effect on economic growth. The household consumption variable obtained a coefficient of –0.0004462, the statistical prob z of 0.336 > 0.05. In the short term, household consumption partially has no significant effect on economic growth.

The labor variable obtained a coefficient of -0.0000326, a statistical prob z of 0.000 < 0.05. In the short term, labor partially has a negative and significant effect on economic growth. The infrastructure variable obtained a coefficient of 0.0141216, the statistical prob z of 0.000 < 0.05(alpha). In the short term, infrastructure partially has a positive and significant effect on economic growth.

Wald test

This wald test is carried out to determine the influence of independent variables simultaneously on dependent variables, as the results of the Wald test are in Table 6.

Table. 6 Wald test

Chi-Square	Prob.
9.809211	0.0000

Source: data processed, 2022

Based on Table 6 obtained a prob chi-square value of 0.000 < alpha (0.05), it can be concluded that lagged economic growth, government expenditure, household consumption, labor, and infrastructure simultaneously or together significantly affected economic growth.

The SYS GMM model estimation in the long run

Based on the results of processed data obtained, estimates of the influence of government expenditure, household consumption, labor, and infrastructure on economic growth in the long term can be seen in Table 7.

Table 7. Long-term SYS GMM model estimation

Variable	Coefficient	Std.Error	z-Statistics	Prob.
GE	0.0023838	0.0034459	0.69	0.489
HC	-0.000896	0.0008975	-1.00	0.318
L	-0.0000655	0.0000366	-1.79	0.074
INF	0.0283536	0.0077576	3.65	0.000

Z test

Based on Table 7 of the variable government expenditure coefficient of 0.0023838 prob z of 0.489 > 0.05. In the long run, government expenditure partially has no significant effect on economic growth. Household consumption variables have a coefficient value of -0.000896 and a prob z of 0.318 > 0.05. In the long term, household consumption partially has no significant effect on economic growth.

Labor variables with a coefficient value of -0.0000655, and a prob z value of 0.074 > 0.05, show that labor partially has no significant effect on economic growth in the long run. Infrastructure variables have a coefficient of 0.0283536 and a prob z of 0.000 < 0.05. In the long term, infrastructure partially has a positive and significant effect on economic growth.

Discussion

The effect of lagged economic growth on economic growth

Based on the processed data, the variable lag of economic growth has a positive and significant effect on economic growth. If there is an increase in the previous economic growth of 1%, then economic growth will increase by 5%. The results of this study are by Keynes's theory, where economic growth occurs when aggregate demand exceeds its supply, then experiences a state of "production shortage". In the next period, the output or the price will increase, allowing it to occur simultaneously (Mankiw, 2007). The increase in output is carried out so as not to lack stock of goods if the demand is high again, with the increase in such output, in the long run, will be able to increase economic growth. This theory is proven by research conducted by Abdouli and Hammami (2017), which found that lagged economic growth has a positive and significant effect on economic growth in MENA countries. The results of this research are different from other regions, namely Vietnam, supported by research conducted by Phuong and Tuyen (2018) shows that lagged economic growth had a negative and significant effect on economic growth in Vietnam.

The effect of government expenditure on economic growth

Based on the processed data, government expenditure variables have no significant effect on short-term and long-term economic growth. The findings of this study do not align with Keynes's theory which argues that what can determine the level of the economy is aggregate demand and one of the components of aggregate demand is government expenditure. This study's findings are consistent with Hakib's (2018) research showing that government expenditure does not significantly affect economic growth. The insignificant effect of government expenditure occurs because the expenditures incurred are not always on matters of a developmental nature to encourage the economy, such as expenditures on infrastructure and public facilities that become facilities and infrastructure in production process activities. Then the allocation of funds spent on development that can encourage economic growth is less than expenditures for funding government apparatus such as expenditures on employee salaries, official travel, maintenance expenditures, and others.

Based on data from the Directorate General of Financial Balance, the average expenditure of the Regency/City government in Jambi Province during 2011-2020, according to the type of expenditure, the average for capital expenditures of a development nature is 3,398.21 billion rupiahs or 23.16% of the total expenditure. While consumptive expenditures, namely employee expenditures, amounted to 5,801.32 billion rupiahs or 39.54% of total expenses, they were then shopping for goods and services consisting of official travel expenses, rent of the building, purchase of office stationery and other proportion of 20.09% or 2,801.78 billion rupiahs. The remaining 17.21% is for other expenditures. The proportion of expenditure for funding government officials in Jambi Province is large because there are many civil servants and honorary workers whose salaries come from the Regional Budget of Jambi

regency/city. The number of civil servants in Jambi Province in 2020 was 11,082 people.

Based on this, it illustrates that the government tends to allocate its funds to government apparatus funding. The proportion of expenditures on the nature of development is smaller than that of expenditures on matching government apparatuses, causing government expenditures to have no significant effect on economic growth in the short and long term. This research results differ from other regions, namely East Java Province. Where the total budget in East Java Province is greater, reaching 101,163.84 billion rupiahs, while in Jambi Province, in the same year, it was only 15,758.10 billion rupiahs. The size of the East Java Provincial government's output can encourage economic growth. This is supported by research conducted by Hidayat and Nalle (2017), showing that government spending has a positive and significant effect on economic growth in East Java Province.

The effect of household consumption on economic growth

Based on the processed data, the household consumption variable has no significant effect on economic growth in the short term or in the long term. The results of this study are not in accordance with Keynes's theory which explains that it can determine the level of the economy, namely aggregate demand, and household consumption is one of the components of aggregate demand. This study's findings are consistent with the research of Rasasi et al. (2021) that household consumption has no significant effect on economic growth. This study's findings demonstrate that household consumption does not always have an impact on a region's economic growth because household consumption does not have a significant impact on economic growth. This is because there are still many products or goods needed by society that are not produced in Jambi and are brought from outside the Jambi area. With this, it can be ascertained that there are still many goods consumed by the community from outside the Jambi area.

Based on data from BPS, the average per capita expenditure a month in 2011-2020 in Jambi Province for non-food expenditures the highest percentage is the housing and household facilities category of 22.42, then the second is the category of various commodities and services at 12.9%, the third highest in the durable commodity category at 4.64% and the fourth highest is for the clothing and the like category at 3.72%. Based on data from BPS, the number of apparel industry companies in Jambi Province is 1 company, namely PT Fortsindo. With a large variety of clothes and the like consumed by the people, however, there is only 1 apparel industry company in Jambi Province, meaning that Jambi Province still supplies apparel to meet the community's diverse needs. It indicates that many apparel goods are still consumed by people from outside the Jambi Province area.

Then the highest percentage for the average food expenditure, namely the food and beverage category, is 11.55% of the total expenditure. Based on data from BPS, the number of food industry companies in Jambi Province is 94 companies with 11 different types of industries (BPS, 2020). With many types of diverse types of community needs in Jambi Province, there are only 11 different types of industries, meaning that there are still many food items supplied from outside the Jambi area to meet various types of societal needs. Furthermore, the second highest average percentage of food expenditure is cigarettes at 7.73% of total expenditure. Cigarette products are still supplied from

outside the Jambi Province area because no industries or companies produce cigarettes in the Jambi Province area. Then the third highest average expenditure is grains at 7.71%. For rice products themselves to meet insufficient needs, most of them still supply rice from the provinces of South Sumatra, Lampung, and West Sumatra (BPS, 2020).

With many types of community needs, there are only a few types of goods or commodities produced in Jambi, meaning that Jambi Province still supplies many goods from outside Jambi Province. It results in many people consuming goods produced from outside the Jambi area to meet their daily needs. Thus, household consumption does not significantly affect economic growth in the short and long term. This study's results differ from other regions, namely in North Sulawesi Province, supported by research conducted by Haniko et al. (2022) showing that household consumption has a positive and significant effect on economic growth in North Sulawesi Province.

The effect of labor on economic growth

Based on the processed data, labor variables in the short term have a negative and significant effect on economic growth. Still, labor does not significantly affect economic growth in the long term. The findings of this study do not align with the Solow-Swan theory, which holds that labor is one of the production factors and that if there is a lot of labor, production output can be increased. This study's findings are consistent with the research of Pandudetya et al. (2021) that labor has a negative and significant effect on economic growth in the short term. The results of this study show the negative influence of labor on economic growth, due to the large number of unproductive labor that results in not being able to boost the economy even though there are many workers. For the creation of productivity, it is necessary to skilled experts in order to produce goods and services, one of the measures of productivity and quality of labor is the level of education.

Based on data from BPS workers with completed education, the average workforce in Jambi Province from 2011-2020 who did not graduate and elementary school graduates were 684,187 people, while junior high school graduates were 301,942 people, high school graduates were 409,805 people and college graduates were 175,863 people. This indicates that there are still many workers with education completed at a level below high school by 60.04%. This illustrates that many workers in Jambi Province still lack trained skills, so their productivity is low in carrying out production. Furthermore, this unproductive labor occurs due to many unfulfilled or underemployed labor. Based on data from BPS, the average population who worked 35 or more hours of work in a week (full labor force) in Jambi Province from 2011-2020 there were 862,170 people, and during the full workforce with as many as 709,532 people or 45.1% of the total.

This indicates that there are still many non-full workers in Jambi Province, with a large number of non-full workers; this means that there are still many unproductive workers. Therefore, the large number of unproductive and unskilled or underskilled labor results in low productivity or insufficient production levels. The results of this study differ from other regions, namely in the member countries of the Organization of Islamic Cooperation (OIC), supported by research conducted by Yeisa and Rani (2020) showing that labor has a positive and significant effect on economic growth in OIC countries.

Then, in the long run, labor has no significant effect on economic growth. This happens because the workforce does not have the skills and skills to be able to increase production in the long term. This means that labor has no long-term effect on the level of production in the long term. Therefore, labor in the long term does not have a significant effect on economic growth. The results of this study align with research conducted by Tarigan (2022), which shows that the workforce does not significantly affect economic growth in North Sumatra in the long run. However, the results of this study are different from other regions, namely in ASEAN countries, supported by research conducted by Widyawati (2017) showing that in the long run, the workforce has a positive and significant effect on economic growth in ASEAN countries.

The effect of infrastructure on economic growth

Based on the processed data, infrastructure variables positively and significantly affect economic growth in the short and long term. This study's findings are consistent with the research of Sahoo et al. (2010), where infrastructure has a positive and significant effect on growth. The positive influence of this infrastructure is that road infrastructure contributes greatly to the smooth distribution that can allow production to be greater. Adequate road infrastructure can connect one area to a remote area. In the long run, the remote area will form new reef centers and, in turn, will grow the economic level in the region. Therefore, road infrastructure has a positive and significant effect on economic growth in the short and long term. The results of this study differ from other regions, namely in North Sumatra Province, supported by research conducted by Syamsidar (2021) showing that infrastructure does not significantly affect economic growth in North Sumatra Province.

CONCLUSIONS AND RECOMMENDATION

Conclusions

Based on the analysis results, it can be concluded that lag economic growth had a significant positive effect. In the short term, labor has a significant negative effect, and infrastructure has a significant positive effect on economic growth. At the same time, government spending and household consumption have no significant effect on economic growth. In the long run, infrastructure has a significant positive effect on economic growth. Meanwhile, government spending, household consumption, and labor have no significant effect on economic growth.

Recommendation

It is hoped that the government will be able to boost the economy by intervening or interfering with the government in policies and managing government expenditures so that their use is efficient and on target and increase the allocation of development expenditure funds.

Then it is hoped that the government can create training programs in various fields for workers to increase skills so that productivity increases. And it is hoped that the government will be able to create investment and facilitate its licensing so that investors can establish new companies and factories that can produce and supply goods for the needs of the society in Jambi Province.

REFERENCE

Abdouli, M., & Hammami, S. (2017). The Impact of FDI Inflows and Environmental Quality on Economic Growth: an Empirical Study for the MENA Countries. *Journal of the Knowledge Economy*, 8(1), 254–278.

Baltagi, B. H. (2005). *Econometric Analysis of Panel Data* (Third). England: John Wiley & Sons.

Boediono. (2009). *Teori Pertumbuhan Ekonomi*. Yogyakarta: BPFE UGM.

BPS. (2021a). *Berita Resmi Statistik (Pertumbuhan Ekonomi Provinsi Jambi Triwulan IV 2020)*. Jambi: BPS Provinsi Jambi.
https://jambi.bps.go.id/pressrelease/2021/02/05/498/ekonomi-provinsi-jambi-2020-terkontraksi-0-46-persen.html.

BPS. (2021b). *Direktori Industri Pengolahan Besar dan Sedang Provinsi Jambi 2020*. Jambi: BPS Provinsi Jambi.
https://jambi.bps.go.id/publication/2021/09/09/b5e853ade7e6f3c8ea585d5d/direktori-industri-pengolahan-besar-dan-sedang-provinsi-jambi-2020.html

BPS. (2021c). *Persentase Pengeluaran Per Kapita*. Jambi: BPS Provinsi Jambi.
https://jambi.bps.go.id/indicator/5/1619/1/persentase-pengeluaran-per-kapita-.html

BPS. (2021d). *Pola Distribusi Perdagangan Provinsi Jambi 2020*. Jambi: BPS Provinsi Jambi.
https://jambi.bps.go.id/publication/2021/03/08/7e02ae5af820e398dc75678c/pola-distribusi-perdagangan-provinsi-jambi-2020.html.

BPS. (2021e). *Provinsi Jambi Dalam Angka Tahun 2011-2021*. Jambi: BPS Provinsi Jambi.
https://jambi.bps.go.id/publication/2020/05/20/32c000f51fd9b52af6315cfd/provinsi-jambi-dalam-angka-2020.html.

Burlando, R., & Tartaglia, A. (2018). *Physical Limits to Economic Growth : Perspectives of economic, social, and complexity science*. London: Routledge.
https://doi.org/https://doi.org/10.4324/9781315314969

Direktorat Jenderal Perimbangan Keuangan. (2020). *Postur APBD (Pemerintah Kabupaten/Kota Provinsi Jambi Tahun 2011-2020)*. Jakarta: Direktorat Jenderal Perimbangan Keuangan.
https://djpk.kemenkeu.go.id/portal/data/apbd?tahun=2020&provinsi=05&pemda=-

Gujarati, D. (2012). *Basic Econometrics*. New York: McGraw-Hill.

Hakib, A. (2018). The Effect Of Household Consumtion and Goverment Expenditure on Economic Growth in South Sulawesi 2012-2016. *BALANCE : Jurnal Ekonomi*, 14(2), 281–290.

Halim, A. (2018). *Teori Ekonomi Makro*. Jakarta: Mitra Wacana Media.

Haniko, V. S., Engka, D. S. M., & Rorong, I. P. F. (2022). Pengaruh Konsumsi Rumah Tangga, Jumlah Ekspor dan Pengeluaran Pemerintah Terhadap Pertumbuhan Ekonomi Sulawesi Utara. *Jurnal Berkala Ilmiah Efisiensi*, 22(2), 110–122.

Hidayat, A. S., & Nalle, F. W. (2017). Analisis Pengaruh Belanja Pemerintah, Tenaga Kerja, Dan Pendapatan Asli Daerah Terhadap Pertumbuhan Ekonomi Regional Provinsi Jawa Timur Tahun 2010-2015. *Jurnal Ekonomi Pembangunan*, 15(1), 71–86.

Joshua, U. (2019). An ARDL approach to teh goverment expenditure and economic growth Nexus in Nigeria. *Academic Journal of Economic Studies*, *5*(3), 152–160.

Juanda, B., & Junaidi. (2012). *Ekonometrika Deret waktu : Teori & Aplikasi*. Bogor: IPB Press.

Mankiw, N. G. (2007). *Makro Ekonomi* (6th ed.). Jakarta: Erlangga.

Mohmand, Y. T., Wang, A., & Saaed, A. (2016). The impact of transportation infrastructure on economic growth : empirical evidence from Pakistan. *The International Journal of Transportation Research*, *9*(2), 63–69.

Pandusetya, D. C., Maskie, G., & Muljaningsih, S. (2021). Analysis of the Influence of Goverment Expenditure, Investment, and Labor Force On Economic Growth In Malang Regency 2000-2018. *International Journal of Business, Economics and Law*, *24*(1), 71–78.

Petrakis, P. E. (2020). *Theoretical Approaches to Economic Growth and Development : An Interdisciplinary Perspective*. Athens: Palgrave Macmillan. https://doi.org/https://doi.org/10.1007/978-3-030-50068-9

Phuong, N. D., & Tuyen, L. T. M. (2018). The relationship between foreign direct investment, economic growth and environmental pollution in vietnam: An autoregressive distributed lags approach. *International Journal of Energy Economics and Policy*, *8*(5), 138–145.

Rahman, Y. A & Chamelia, A. L. (2015). Faktor - Faktor Yang Mempengaruhi Pdrb Kabupaten / Kota Jawa Tengah Tahun 2008-2012. *Jurnal Ekonomi Dan Kebijakan*, *8*(1), 88–99.

Rasasi, M. A., Alzahrani, Y., & Alassaf, M. (2021). On the Causal Relationship between Household Consumption and Economic Growth in Saudi Arabia. *Business and Economic Research*, *11*(2), 165–177.

Sahoo, P., Dash, R. K., & Nataraj, G. (2010). *Infrastructure Development and Economic Growth in China* (Issue 261). Institue Of Development Economics, Japan External Trade Organization (JETRO).

Syamsidar, S. (2021). *Analisis Pengaruh Infrastruktur terhadap Pertumbuhan Ekonomi di Provinsi Sumatera Utara*. Universitas Sumatera Utara.

Syaparuddin., Zulgani., Artis, D., & Saputra, J. (2019). A study of investment pattern through economic sectors-based in Indonesia. *International Journal of Innovation, Creativity and Change*, *9*(2), 227–240.

Tapparan, S. R. (2020). Analisis Pengaruh Pengeluaran Konsumsi Rumah Tangga Dan Pengeluaran Pemerintah Terhadap Pertumbuhan Ekonomi Tana Toraja. *Journal Ekonomika Lidikti*, *4*(2), 12–18.

Tarigan, E. B. (2022). *Pengaruh Investasi, Tenaga Kerja dan Ekspor Terhadap Pertumbuhan Ekonomi Sumatera Utara Tahun 2000-2021*. Universitas Pembangunan Nasional Veteran.

Todaro, M. P., & Smith, S. C. (2012). *Economics Development* (11th ed.). New York: Addison-Wesley.

Widyawati, R. F. (2017). Dampak Keterbukaan Perdagangan Internasional, Modal Manusia dan Aliran Modal Terhadap Pertumbuhan Ekonomi Negara ASEAN-5 Tahun 1993-2013. *Ekuilibrium : Jurnal Ilmiah Bidang Ilmu Ekonomi*, *14*(1), 58–70.

Yeisa, W., & Rani, L. N. (2020). Analisis Faktor-Faktor Yang Mempengaruhi Pertumbuhan Ekonomi Di Oki. *Jurnal Ekonomi Syariah Teori Dan Terapan*, 7(6), 1128–1145. https://doi.org/10.20473/vol7iss20206pp1128-1145