EFFECT OF DEVELOPMENT OF INDUSTRIAL TRANSPORTATION AND AGLOMERATION SECTORS ON ACEH ECONOMIC GROWTH

Abstract

This study aims to determine the development of the transportation sector and industrial agglomeration towards economic growth in Aceh Province. This study uses data regression analysis method of Fixed Effect and White cross section Panels. Panel Data Test Results show that of the 6 variables, there are two variables that show a negative relationship to economic growth, namely Capital Expenditure (BM) and Road Length PerCapita (JPK), while 4 other variables show a positive relationship, namely the Index of Specialization (IS), Gross Fixed Capital Formation (PMTB), Road Length (PJL) and Average School Duration (RLS). Test results also show that there are significant variables, namely the variable Gross Fixed Capital Formation (PMTB) and Capital Expenditures (BM), and the non-significant multiple variables, namely the Specialization Index (IS), Average School Length (RLS), Road Length (PJL) and Distance per Capita variable (JPK). To increase the economic growth of the government so that the transportation sector become one of the priorities, to facilitate the mobility of goods and services in the region, as well as one way to create agglomeration, besides that the government must also improve aspects as capital in economic growth and improvement of agglomeration in the regions.

Keywords:
Economic Growth, Fixed Effect Methods, Agglomeration and Transportation

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INTRODUCTION

Economic development is a process of increasing total income and per capita income taking into account the existence of population growth and accompanied by fundamental changes in the economic structure of a country and income distribution for the income of a country. Economic development cannot be separated from economic growth, economic development encourages economic growth and vice versa economic growth facilitates the process of economic development.

Table 1. GRDP Growth Rate of Aceh Province shows an upward trend from 2011 - 2012, but in 2013 - 2014, there was a slowdown in the growth rate of Aceh GRDP of 4.15 and 4.02 percent, this is very regrettable because the slowdown in economic growth could hamper investment in Aceh Province. According to Todaro (2006) there are three main factors or components that must be fulfilled in the formation of economic growth of each nation. These three factors are: (1) capital accumulation, which includes all forms or types of new investments invested in land, physical equipment, and capital or human resources (2) population growth, which in the next few years will increase the number of labor force (3) technology advances.

In addition to these factors, other factors emerge in the context of regional economic growth, namely the benefits of agglomeration economies. As stated by Bradley and Gans (1996), the
agglomeration economy is an externality that results from the geographical proximity of economic activity. Furthermore, the existence of an agglomeration economy can have a positive influence on the rate of economic growth. As a result, regions that are included in agglomeration generally have a higher growth rate compared to regions that are not agglomerations.

THEORETICAL FRAMEWORK

Economic Growth

Economic growth is a process of increasing productive capacity in an economy continuously over time so as to produce a level of national income and output that is increasingly large. According to Todaro and Smith (2006), there are three main factors or components in economic growth, namely:
1. Capital accumulation, which includes all forms or types of new investments invested in land, physical equipment, and capital or human resources.
2. Population growth which in the following years will increase the workforce.
3. Technological progress.

New Geographic Economy Theory

Economic Theory New geography seeks to reduce the agglomeration effects of interactions between market size, transportation costs and increasing returns from companies. In this case the agglomeration economy is not assumed but derived from the interaction of economies of scale at the company level, transportation costs and mobility of production factors. The new economic theory of geography emphasizes the existence of a circular causality mechanism to explain the spatial concentration of economic activity (Krugman, 2008). In this model centripetal strength comes from variations in consumption or various intermediate good in the production side. Centrifugal force comes from the pressure possessed by the geographical concentration of local input markets that offer higher prices and the spread of demand. If transportation costs are quite low, agglomeration will occur.

Krugman (2008) reveals that there is a tendency for workers to migrate to the largest labor center area which will eventually create a very diverse product variety. In other words, concentration occurs in terms of the goods and services produced and the location of the goods made. According to Krugman, cities tend to be specialized with industry. Based on economies of scale, industries will tend to be concentrated in large cities. The concentration of production in one particular area (in this
case urban areas), allows economies of scale to be realized because the proximity of the location to the market will minimize transportation costs (home-market effect).

In the model of technological externality, the transfer of knowledge between companies provides incentives for agglomeration of economic activities. Information is treated as public goods; in other words, there is no competition in obtaining it. This diffusion of information then produces benefits for each company. Assuming that each company produces different information, the benefits of the interaction increase with the number of companies. Because this interaction is informal, the expansion of information exchange decreases with increasing distance. This provides incentives for entrepreneurs to be located close to other companies so as to produce agglomeration.

Industry

Industry is all human economic activities that process raw materials or raw materials into semi-finished goods or finished goods, in a broader sense, industry can be interpreted as all productive and commercial human activities in the economic field to meet the needs of life. Industry in a broad sense is divided into two types, namely as follows:

1. Primary Industry, which is an industry that directly takes economic commodities from nature without processing, such as agriculture, mining and forestry.
2. Secondary Industry, which is an industry that processes raw materials or raw materials into semi-finished or finished goods. Secondary industries are also called manufacturing industries or factories.

Industrial Types are then grouped based on the number of workers involved. Based on this, the industry is divided into four types, namely:

- Large Industry, which is an industry with a labor of more than 100 people.
- Medium Industry, which is an industry whose labor is 20 - 99 people.
- Small Industry, which is an industry whose labor is 5-19 people.
- Home Industry, which is an industry with a labor of 1 - 4 people.

Agglomeration

Montgomery (1988) define agglomeration savings as savings due to economies of proximity associated with grouping of companies, labor, and consumers spatially to minimize costs such as transportation, information and communication costs. Agglomeration is a location that is "not easy to change" due to external savings that are open to all companies that are located close to other companies and service providers, and not due to the calculation of individual companies or workers.
(Kuncoro, 2002). Furthermore, by referring to some of these definitions, it can be concluded that agglomeration is the concentration of economic activity and spatial population that arises because of the savings obtained due to adjacent locations.

Furthermore, according to McCann (2006) types of economic agglomeration sources are grouped into three, namely:

• Information Spillovers.

If many companies in similar industries agglomerate in the same location, workers in certain companies are relatively easy to relate to workers from other local companies. Thus, information exchange between workers and between companies will take place at any time.

• Non-traded local inputs.

In situations where companies in similar industries cluster in one place there are certain inputs that become more efficient if used jointly by workers in these companies compared to if these inputs are purchased individually by these companies.

• Local skilled-labor pool.

The availability of skilled labor in the area will cause a decrease in labor costs for companies in that location.

**Transportation**

The definition of transportation proposed by Nasution (1996) is defined as the transfer of goods and people from the place of origin to the destination. So that with these activities there are three things, namely the cargo being transported, the availability of vehicles as a means of transport, and the presence of roads that can be traversed. The process of moving from the movement of the place of origin, where the transport activity begins and to the destination where the activity is terminated. For this reason, with the transfer of goods and people, transportation is one sector that can support the economic sector and the service sector for economic development. Another definition was stated by Soesilo (1999) who argued that transportation is a movement of people's behavior in space both in carrying themselves and carrying goods. In addition, Tamin (1997: 5) revealed that transportation infrastructure has two main roles, namely: (1) as a tool to guide development in urban areas; and as infrastructure for the movement of people and / or goods arising from activities in the urban area.

**Effect of Transport Infrastructure and Agglomeration on Economic growth**
Shi (2009) in his research entitled "An empirical study on the regional economic impacts of transport infrastructure for China" aims to investigate the relationship between the development of transportation infrastructure, savings due to agglomeration and economic growth in China with the perspective of new economic geography. The methodology used is based on the estimation of the Cobb-Douglas model which combines micro enterprise variables with a measure of regional characteristics regarding infrastructure development and industrial agglomeration. The result of Tuo Shi’s research is that the output level of each company is influenced by the agglomeration savings which consist of access to the market center, savings in localization and savings in urbanization. Transportation infrastructure also plays a role in increasing the company's output.

**LITERATURE REVIEW**

An empirical study that examines the relationship between Economic Growth and Agglomeration, and the Transportation Sector, among others, Mauleni (2010) analyzes Agglomeration, Socio-Economic and Development Policy Changes in Jakarta using the fixed effect panel data regression method using city / district administration data in Jakarta in 2008-2013. The results of the study showed that the production agglomeration had a significant and positive effect on economic growth but negative on the level of poverty and HDI.

Based on the results of the research by Putra (2015) regarding the Advantages of Agglomeration and Industrial Efficiency concluded that the existence of a concept of agglomeration advantage as a causal process will result in a spread effect of agglomeration gains that produce agglomeration profits can produce three forms of benefits: (1). Large-scale profits (scale economies) that occur because both the available raw materials and will create a market in a related location, (2). Advantages Localization (localization economies) where the cost of transportation that was initially still alone in the surrounding area will be cheaper because used together and, (3). The advantage of using urbanization economies such as electricity, warehouses, transport fleets, water is a concentration of agglomeration.

Research conducted by Stuart (1997) on the Micro Foundation of Economic Agglomeration in the manufacturing industry in the United States, this study measures the spatial concentration on industrial characteristics that represent the existence of knowledge spillovers, labor market incorporation, input sharing, product shipping costs and natural benefits. The results show that proxy for labor gathering has the most powerful effect, positively influences agglomeration at all levels of geography, proxy spillovers knowledge only affects only at the zip code level and also applies to the proxy of input sharing, shipping costs and natural benefits.
Furthermore, research on the significant contribution of companies that have high growth in the manufacturing sector in South Korea by Choi and Choi (2015) shows that companies with high growth tend to be more productive, and companies with higher productivity are more likely to experience strong growth in employment. Furthermore, localization, the concentration of companies in one industry, strengthens this positive relationship by increasing productivity which then leads to high job growth. These findings imply that spatial policy can play a complementary role in maintaining a large number of companies with strong growth potential in employment.

Research by Gardiner, Martin, and Tyler (2010) on the positive assumptions between Spatial agglomeration impacts and National growth indicate a trade-off between National growth and Spatial Agglomeration, more specifically based on economic activity in the European Union in 1981-2007 showing trade-offs between national growth and irregular agglomeration, depending on the size of the agglomeration adopted and the spatial scale in which the analysis was carried out.

Research by Srinivasu and Srinivasa (2013) on Prospects and Perspectives on Infrastructure Development and Economic Growth suggests that infrastructure is a prerequisite for economic development. The Transportation Sector, telecommunications, energy, water, health, housing and education facilities have become part of human existence. It's hard to imagine a modern world without this facility. This is very important for household life and for economic activities. Infrastructure plays an important role in driving economic growth and thus contributes to a reduction in economic disparity, poverty and deprivation in a country. Greater access from poor people to education and health services, water and sanitation, road networks and electricity is needed to bring equitable development and social security. This is an important pre-condition for sustainable economic and social development. Infrastructure investments in transportation (roads, railways, ports and civil aviation), electricity, irrigation, watersheds, hydroelecctrics, scientific research and training, markets and warehousing, communication and informatics, education, family health and welfare play a strategic role but not directly in the development process, but contributes significantly to growth by increasing the productivity factors of land, labor and capital in the production process, especially safe drinking water and sanitation, basic education facilities greatly affect the quality of life of the community.

FLOW OF THOUGHT

Economic development of a region can be analyzed through its economic growth rate, where its development is determined by the production output capacity produced by the region. Meanwhile production output capacity is very much determined by capital accumulation or investments made, labor productivity, and the use of technology in economic activities.
One form of utilization of public investment is the development of infrastructure services that support economic activities both economic infrastructure, social infrastructure, and administrative infrastructure. Infrastructure Development in the form of transportation facilities in all Regencies / Cities has an influence on economic growth in each region. Whereas Agglomeration and means of transportation have a close relationship.

Therefore, it is necessary to analyze the economic growth in Aceh and see the magnitude of the influence of the transportation sector and industrial agglomeration on economic growth in Aceh.

MATERIALS AND METHODS

Types and Source of Data

This study uses secondary data obtained from various sources. The data to be used is the data of all Regencies / Cities in Aceh Province, covering the period of 2011-2015. The data used in this study consists of:

Gross Regional Domestic Product (GRDP) at constant 2010 prices District / City in Aceh Province
Number of Labor Force in Aceh Province, Road Length Data according to National Road Conditions of Regency / City in Aceh, Gross Fixed Capital Formation Data (PMTB) District / City in Aceh, Data of Medium Large Industrial Manpower in Regencies / Cities in Aceh, Data of Regency / City Capital Expenditures in Aceh, and Population of Districts / Cities in Aceh

Due to Limitations of Data - Supporting data collected is incomplete, then only 17 District / City data are used to estimate, namely: Aceh Singkil, South Aceh, Central Aceh, West Aceh, Aceh Besar, Pidie, Bireuen, North Aceh, Aceh Tamiang, Nagan Raya, Aceh Jaya, Pidie Jaya, Banda Aceh City, Sabang City, Langsa City, Lhokseumawe City, and Subulussalam City, and what is meant by Industry in this Research is Medium Large Industry.

Panel Data Regression

Panel data are the same individual units observed in a certain period of time. In general, panel data is characterized by small T periods of time (t = 1, 2, ..., T) and large n numbers of individuals (i = 1, 2, ..., n). Through panel data analysis, we can capture the behavior of a number of individuals who have different characteristics in a time span consisting of different time units. Heterogeneity between individuals and between times is illustrated in models with different intercepts and slope coefficients. The intercept values and different slope coefficients are derived from the influence of variables not included in the explanatory variables in the ordinary regression equation.
According to Baltagi (2005), several advantages of using panel data are as follows:

1. The data panel is able to accommodate the level of heterogeneity of variables that are not included in the model (unobserved heterogeneity),
2. Data panels are able to indicate and measure effects that simply cannot be obtained with pure cross section data or pure time series, such as the effect of minimum wages,
3. Panel data can reduce the collinearity between variables

There are three approaches in the data panel method, namely Fixed Effect Model (FEM), Random Effect Model (REM) and Pooled Least Square (PLS). The three are distinguished based on the presence or absence of the correlation between the error component and the independent variable. For example:

\[ y_{it} = \alpha_i + X_{it} \beta + \varepsilon_{it} \]

On the one way error components model, the error component is specified in the form:

\[ \varepsilon_{it} = \lambda_i + \mu_{it} \]

On the two way error components model, the error component is specified in the form:

\[ \varepsilon_{it} = \lambda_i + \mu_{it} + u_{it} \]

In the one way approach, the error term only includes the error component which is the effect of the individual (\( \lambda_i \)). At two ways the effect of time is inserted (\( \mu_t \)) into the error component. So the difference between FEM and REM lies in whether or not there is a correlation between \( \lambda_i \) and \( \mu_t \) with \( X_{it} \). The test used in determining these three methods is the Hausman test and the Chow test.

**Model Analysis**

The analysis model used to determine the effect of industrial agglomeration and the transport sector on economic growth is panel data analysis where panel data analysis is a combination of data between time series (time series data) and arithmetical data (cross section data). The model used to analyze the impact of infrastructure development and manufacturing industry agglomeration on regional economic growth in Indonesia is the development of the Cobb-Douglas production function.

\[ Y = AK^\alpha L^\beta \]  

\[ \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1) \]

The reason for choosing the Cobb-Douglas production function is related to its advantages: the settlement is relatively easy (easy to transfer in linear form), the estimation coefficient is elasticity, and the sum of the elasticity shows the amount of return to scale, and this production function has been widely used in research research to estimate the potential output of a region (Soekartawi, 1994).
In this study, infrastructure capital and human capital are inputs to aggregate production. The econometric model used is based on the model used by Canning (1999) in the paper "Infrastructure's Contribution to Aggregate Output", this model is also used by Bronzini and Piselli (2006). The model is as follows:

\[ G_{it} = A_{it} K_{it}^{\alpha} H_{it}^{\beta} X_{it}^{\gamma} L_{it}^{\delta} U_{it} \]  ....(2)

Where: Y is output, A is total factor productivity, K is capital stock, H is human capital, X is infrastructure capital, L is labor, and U is error term. Whereas for i is the District / City index and t is the time index.

The estimation process requires equations in linear form, therefore equation (2) is transformed in natural logarithms as follows:

\[ \ln G_{it} = \ln A_{it} + \alpha \ln K_{it} + \beta \ln H_{it} + \gamma \ln X_{it} + \delta \ln L_{it} + \epsilon_{it} \]  .............(3)

In this study the agglomeration variable (ISit) will approach the size of the specialization index (IS), Human Capital (H) and Capital Stock (K). Infrastructure Capital (Xit) is broken down into Road Length, Capital Expenditure and Length of PerKapita Road, Human Capital (H) is approached by Average School Age (RLS), Capital Stock (K) is approached by Gross Fixed Capital Formation (PMTB), Therefore that, the equation can be written in full as follows:

\[ G_{it} = A_0 + \beta_1 IS_{it} + \beta_2 PMTB_{it} + \beta_3 RLS_{it} + \sigma_1 PJL_{it} + \sigma_2 BM_{it} + \sigma_3 JPK_{it} + \epsilon_{it} \]

Industrial Agglomeration Variables are controlled through:
1. Index of Specialization (IS);
2. Gross Fixed Capital Formation (PMTB);
3. Average School Duration (RLS).

Transport Sector Variables are controlled through:
1. Road Length (PJL)
2. Capital Expenditures (BM)
3. Road length per capita (JPK)

ISit (Specialization Index) is an index of industry specialization that describes the concentration of industry in the district i and year t. This index is calculated using the Medium Large Industry (IBS) employment data. The formula used is as follows:

\[ IS_{ir} = \frac{E_{ir}/E_r}{E_i/E} \]

Where, Eir is an IBS workforce in a district, Er is the total workforce in the regency r, Ei is the IBS workforce in Aceh province; E is the total workforce in Aceh. Gross Fixed Capital Formation (PMTB) is expenditure for capital goods that have a service life of more than one year and are not
consumption goods. Capital Expenditures are budget expenditures for the acquisition of fixed assets and other assets that benefit more than one accounting period, Jalan Per Kapita is the average length of road owned by each person in the Regency / City. The average length of schooling is calculated from the last level of education of workers, where each level of education is equaled to the number of years needed to take the education.

RESULT AND DISCUSSION

Selection of Panel Data Regression Method

Panel data analysis to estimate the influence of the development of the transport sector and industrial agglomeration on economic growth using data from 17 districts / cities in Aceh Province in the period 2011-2015 Before estimating it is necessary to choose a regression method. This process is carried out in two stages, namely comparing pooled models with the fixed effects model then proceed with comparing fixed effects models with random effects models. In the first stage the Chow test was used, while in the second stage the Hausman test was used.

Table 4.7 Chow Test Result

<table>
<thead>
<tr>
<th>Effects Test</th>
<th>Statistic</th>
<th>d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>7.174926</td>
<td>(16,62)</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: Hasil Penelitian (2018)

Based on the table above, the p-value obtained in the cross section is 0.0000 < a = 0.05. So Ho is rejected. So it can be concluded that the fixed effect model is better to use than the pooled effect.

After the fixed effects model is generated in the first step, then proceed to the next process, which is comparing the fixed effects model and the random effects model. According to Hsiao (2003) when testing the selection of fixed effects or random effects cannot be determined theoretically, it is better to use a random effect method if data is taken from individual samples or several individuals who are randomly selected to draw conclusions about the population. But if the evaluation includes all individuals in the population or only includes a few individuals with an emphasis on these individuals then it is better to use a fixed effect model.
### Table 4.8 Hausman Test Result

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>25.587996</td>
<td>6</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

Cross-section random effects test comparisons:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fixed</th>
<th>Random</th>
<th>Var(Diff.)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS</td>
<td>-0.012106</td>
<td>-0.030407</td>
<td>0.002874</td>
<td>0.7328</td>
</tr>
<tr>
<td>JPK</td>
<td>-0.198673</td>
<td>0.115546</td>
<td>0.939664</td>
<td>0.7458</td>
</tr>
<tr>
<td>PJL</td>
<td>-0.001742</td>
<td>-0.000375</td>
<td>0.000124</td>
<td>0.9023</td>
</tr>
<tr>
<td>PMTB</td>
<td>0.000004</td>
<td>-0.000000</td>
<td>0.000000</td>
<td>0.0000</td>
</tr>
<tr>
<td>RLS</td>
<td>0.019244</td>
<td>0.222761</td>
<td>0.593496</td>
<td>0.7916</td>
</tr>
<tr>
<td>BM</td>
<td>-0.001930</td>
<td>0.000967</td>
<td>0.000002</td>
<td>0.0597</td>
</tr>
</tbody>
</table>

*Source: Hasil Penelitian (2018)*

Hausman test statistics follow the distribution of Chi Square statistics with free degrees as many as the independent variables in the equation. Hausman test results show p-value (prob.) <0.05, this means that the equality of the impact of the transport sector and industrial agglomeration on economic growth has individual heterogeneity but not randomly. Thus the fixed effects model is more suitable for use.

### The Results of Panel Data Regression

The method that is most suitable for estimating the similarities of factors that influence economic growth is White's fixed effect cross section.

#### Panel Data Regression Result

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable: Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
</tr>
<tr>
<td>Konstanta (C)</td>
<td>-2.5794</td>
</tr>
<tr>
<td>IS (Indeks Spesialisasi)</td>
<td>0.0073</td>
</tr>
<tr>
<td>PMTB</td>
<td>0.0000028</td>
</tr>
</tbody>
</table>
Based on the estimation results, it can be seen that the independent variables that do not significantly affect Growth (Economic Growth), namely Index Specialization, Road Length, Average Length of School and Per Capita Road, while significant influential variables are Gross Fixed Capital Formation (PMTB) and Capital Expenditures (BM), Adjusted R-squared value (determinant coefficient) was obtained at 0.6157 which showed that the independent variables in the model were able to explain 61.57 percent of the variation of endogenous variables well.

The Specialization Index (IS) has a positive relationship to the creation of economic growth. The coefficient value is 0.0073 which means an increase in economic growth of 1 percent will increase the specialization index by 0.0073 percent, ceteris paribus. This positive economic scale coefficient shows that medium large industrial companies in Aceh can increase economic growth in their regions and Aceh Province in general. The results obtained are in accordance with the New Economic Geography hypothesis and theory. The existence of industrial concentration can increase productivity derived from increasing returns (increasing return), cheap transportation costs and migration which ultimately has a positive impact on economic growth in the region. A positive relationship between agglomeration of economic activities and economic growth has been widely proven (Martin and Octavianno, 2001). Agglomeration produces spatial differences in income levels. The more agglomerated spatially an economy will increase its growth.

Gross Fixed Capital Formation (PMTB) has a positive and significant relationship to economic growth. Coefficient value is relatively small, which is 0.0000028, which means that the increase in PMTB of 1 million Rupiah will increase economic growth by 0.0000028 percent. Study conducted by Sitompul (2007); Rustiono (2008); Luntungan (2008); and Sodik (2005) found that regional economic growth was primarily driven by investments that had a significant effect. This means that high investment will increase economic growth.

Average School Length (RLS) has a positive relationship to economic growth. Coefficient value of 0.2951 which means an increase in the average length of school for one year will make economic growth by 0.2951 percent. This is in line with Theodore Schultz's (1960) theory which explains that education is a form of investment in development, Schultz shows that the development...
of the education sector has contributed directly to economic growth. Besides that, economists develop development theories based on the production capacity of human resources in the development process, which became known as Investment in Human Capital (Hidayat, 2003). This theory is based on the consideration that the most efficient way to do national development in a country lies in improving the capacity of its people. Human capital theory assumes that formal education is the most important instrument to produce a society that has high productivity. According to this theory, growth and development have two conditions, namely the efficient use of high technology, and the existence of human resources that can utilize existing technology. Such human resources are produced through the education process.

Road Length has a positive relationship to economic growth. The coefficient value is relatively small, namely 0.0025, the length of the road has an important role in economic activities. Distribution of production factors as well as goods and services produced by production depends on the existence of road infrastructure. Spatially, human mobility and production results determine the progress of an area because interaction and openness with other regions increases market share in both production and production factors. The results obtained are in accordance with Demurger's (2000) study which suggests that transportation contributes significantly to increasing output. The availability of road infrastructure in Indonesian regions has indeed greatly affected the daily activities of a large portion of the population, because roads play an important role in the mobility of society and the economy that exists. In order to increase the contribution of the road to increasing output, the government needs to intensify road development, especially for areas that are still isolated. The availability of the road network in isolated areas is a major prerequisite because it will make it easier to provide access to health, education, information and market services.

Capital Expenditures do not have a positive effect on economic growth with a coefficient of -0.0028, which means that additional capital expenditure of 1 billion will reduce economic growth by 0.0028 percent. This is unexpected because Capital Availability usually has a positive effect on economic growth. If Capital Expenditures are expenditures used for the purchase / procurement or construction of tangible fixed assets that benefit more than a year. Establishment of these assets includes land acquisition, heavy equipment, transportation equipment, workshop tools, agricultural equipment, office equipment and supplies, computers, mebeulair, kitchen equipment, room decoration, studio tools, tools communication, measuring instruments, medical devices, laboratory equipment, construction of roads, bridges, water networks, street lighting, city parks and forests, electrical and telephone installations, buildings, books / literature, art goods, animal procurement / livestock and crops, as well as weaponry / security. So we can expect the possibility that the District / City Capital Expenditure in Aceh has not been maximized or has not touched on increasing
productivity which can lead to economic growth. Besides that, corruption behavior can also cause negative economic growth, Research Results from D’Agostino, Dunne and Pieroni (2016) suggest that Corruption in Government Expenditures, especially large military burdens can cause negative economic growth. How big is Government Expenditure if Corruption is still there, then the goal of economic growth is impossible to achieve. Therefore, appropriate steps are needed in eradicating corruption, so that government spending becomes right on target and economic growth goals can be achieved.

Per Capita Road Length also has no positive effect, with a coefficient of -0.3246. Which means that with an increase in the Road Coefficient per capita will reduce economic growth. The existence of economic centers in the regions is also important, no matter how good the transportation infrastructure is made, if the population in the area does not have economic centers, it will not be an added value to the income of the residents of the area, or in other words the population in the area is not utilizing the existence of the road as a means to be able to increase income, therefore the government must be observant in developing the potential in the regions so that the creation of new economic centers that increase people's income and ultimately will increase economic growth. Besides that, the existence of the population in the area also influences, When the length of the road increases even though the population in the area has moved to another place, then the increase in the road is also meaningless for economic growth. Because there are no more economic drivers in the area, so that conditions can reduce productivity and reduce economic growth.

CONCLUSIONS
Based on the results of data processing in this study, the authors get several conclusions, namely:

1. Agglomeration of Large and Medium Industries in Aceh Province occurs in Aceh Singkil Regency, West Aceh, Aceh Tamiang, Nagan Raya, Langsa City and Subulussalam City. It is understandable that these areas have a concentration of oil palm industry that absorbs a lot of labor.

2. Estimation results of the Model Effect of Industrial Transportation and Agglomeration Sector Development on Economic Growth resulted in Industrial Agglomeration controlled by Index Variables Specialization, and Average School Length (RLS) had a positive and insignificant effect on economic growth, while Variables of Gross Fixed Capital Formation (PMTB) has a positive and significant influence.

3. The Transportation Sector which is controlled by the Road Length, Capital Expenditures and Roads per Capita variables which have a positive effect on Economic Growth is the Road Length variable but not significant, while the Capital Expenditure and Road Expenditure variables each
have a negative effect. However, only capital expenditure variables have a negative and significant effect.

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