Inspirat, 13 (1) (2022) pp. 01-11
Published by: IHSA Institute
Inspirat : Inspirasi & Strategi : Jurnal Kebijakan Publik & Bisnis
Journal homepage: www.ejournal.isha.or.id/index.php/Inspirat

Analysis of the Role of the Transportation and Telecommunication Sector on the Gross Regional Domestic Product (GRDP) of North Sumatra

Aidil Fitriadi Fahruky
Faculty of Economics, University of Northern Sumatra Medan

ARTICLE INFO

Article history:

Received May 9, 2022
Revised Jun 9, 2022
Accepted Jul 30, 2022

Keywords:

GRDP Of The Transportation And Telecommunications Sector
Length Of Roads And Telkom Telephone Users

ABSTRACT

The purpose of this study was to determine the role of the transportation and telecommunications sector on the GRDP of the transportation and telecommunications sector of North Sumatra. In collecting data the author uses secondary data collection techniques. Granger Causality test approach to see the causal relationship between the length of the road and telephone users of Telkom to the GRDP of North Sumatra. and the OLS (Ordinary Least Square) method or the Ordinary least squares method with the help of the E-Views 5.1 program.After conducting theoretical research and test results on the diagnosed hypotheses, in this case, it can be concluded that the length of the road and Telkom telephone users have a role in the formation of GRDP in the transportation and telecommunications sector of North Sumatra. Based on the Granger causality test analysis, the relationship between road length and the GRDP of the transportation and telecommunications sectors shows a one-way relationship, as well as between Telkom telephone users and the GRDP of the transportation and telecommunications sectors, which shows a one-way relationship. And the OLS analysis obtained Estimation Results Y = -18.91450 + 1.584108X1 + 0.894272 X2, meaning that the transportation and telecommunications sector has a significant role in the formation of the GRDP of the transportation and telecommunications sector in North Sumatra.

Corresponding Author:

Aidil Fitriadi Fahruky
Faculty of Economics
University of Northern Sumatra Medan
Jalan Dr. T. Mansur No.9, Padang Bulan, Kec. Medan Baru, Kota Medan, Sumatera Utara 20222
Email: aidilfahruky@gmail.com

1. INTRODUCTION

Measurement of the success rate of a development carried out in an area or region can be seen from the level of economic growth achieved. This economic growth is also an illustration of the impact of development policies implemented in an area, especially in the economic field [1]. The rate of economic growth is formed from various kinds of economic sectors which will indirectly describe the level of economic change that occurs in an area[2], [3].

ISSN 2087-0892

Transportation is a very important and strategic means in various perspectives which is reflected in the increasingly smooth mobility of people and goods[4]. The opening of inter-regional transportation routes means uniting the economic potential between regions, both those relating to natural resources, labor and services and so on, which are related to ongoing economic activities.[5].

The transportation sector has a very important role both in the production process and in supporting the distribution of economic commodities and exports. the contribution of the transportation sector in the formation of the National Gross Domestic Product in 2005 was 3.8%, in the amount of this contribution the realization of the growth of the transportation sector was 6.32% this shows the role of transportation as a supporter, driver and driver for national economic growth[6], [7].

In general, transportation infrastructure carries out the function of public services and national development missions where most of the funding is still dependent on the government, where the government generally views that the transportation sector is very vital for the interests of the State both from an economic point of view as well as from a social, political, government, defense and defense perspective. and security[8].

The telecommunications sector has now become an important part of national life and has influenced the pattern of interaction in all aspects, both economic, political, social and cultural where telecommunications is able to provide direct access to information even though it does not have to meet in person.[9] [10]. The development of the telecommunications sector is believed to attract other sectors to develop, as believed by the world telecommunications organization International Telecommunications Union (ITU), which consistently states that an additional 1% of investment in the telecommunications sector will encourage national economic growth of 3%. This has been proven true in countries like Japan, Korea, Canada, Australia, European countries, Scandinavia, and others who have paid great attention to the telecommunications sector, so that in addition to the increase in the number of telephone users (teledensity), there has also been an increase in economic growth.[11]–[13]

The development of the telecommunications sector is also still facing various challenges, one of which is the ability to follow the development of the telecommunications sector and its utilization based on regulatory support capacity, business potential and level of problem solving ability[14]. Another challenge is that telecommunications development is currently still concentrated in big cities, and the clash of problems between industry and local governments. In addition, to face changes so that the presence of new technology in the telecommunications sector along with its use in the future can provide maximum benefits to achieve the improvement and progress of the nation as well as the welfare of all levels of society.[10], [15].

When viewed from the function of transportation and telecommunications to serve the mobility of people, goods and services both locally, regionally, nationally and internationally, as well as their role as supporters of other sectors. Where the role of the transportation and telecommunications sector will affect other sectors which of course affect the production or income of that sector or other sectors, which ends in an increase in GDP.[16].

Given the role of the transportation and telecommunications sector on GDP, the authors are interested in examining how big the role of the sector is from the infrastructure and service utilization of the sector[17]. The author also wants to see the contribution of the transportation and telecommunications sector to GDP. And the author makes the province of North Sumatra as the research location. North Sumatra Province which has an area of 71,680 Km2 with a population in 2006 of 12,643,494 people. Of course, it requires the role of means of transportation as the mobility of people or goods. And telecommunications facilities that connect or facilitate communication[18].

The growth of the transportation sector in North Sumatra is quite rapid which we can see from the growth of road infrastructure in North Sumatra. In 2003, the length of the North Sumatran road was 32898.43 km and in 2004 it was increased to 663.35 km. Likewise, in 2005 the increase in the length of the North Sumatra road was 1.2% but in 2006 there was no increase. Likewise in the telecommunications

sector that the author sees from connected telephone service users. In 2002, telephone service users connected as many as 371007 subscribers and in 2003 as many as 401952 subscribers.

2. RESEARCH METHOD

The research method is the steps and procedures that will be carried out in collecting empirical data or information in order to solve problems and test research hypotheses. In collecting the data needed in the preparation of this thesis, the author uses the following methods:

2.1 The scope of research

The scope of this research is focused on the role of the transportation and telecommunications sector on the Gross Regional Domestic Product in North Sumatra Province.

2.2 Data Source Type

The type of data used in this study is secondary data in the form of periodic data or time series that are quantitative in nature, namely data in the form of numbers over a period of 20 years (1988-2007), while the source of data is obtained from the publications of the Central Statistics Agency (BPS). Sumatra Province), as well as library materials in the form of readings related to research, websites, articles and journals.

2.3 Data collection technique

In preparing this thesis, the author uses secondary data collection techniques obtained from related agencies, using library research methods, which are obtained from official publications related to research. The data collection technique used is by recording data obtained from various sources mentioned above.

2.4 Data Analysis Model

The data analysis model used is the econometric model, while the method used is the Granger Causality test approach to see the causal relationship between the length of the road and telephone users of Telkom to the GRDP of North Sumatra. and the OLS (Ordinary Least Square) method or the Ordinary least squares method. This method was proposed by Carls Friedrich Gauss. The data used, analyzed quantitatively using statistical analysis, namely multiple linear regression equations

3. RESULTS AND DISCUSSION

3.1 North Sumatra Economic Overview

The land area of North Sumatra Province is 71,680 km 2 , North Sumatra is famous for its plantation area, until now, plantations remain the prima donna of the provincial economy. The plantations are managed by private and state companies. North Sumatra produces rubber, cocoa, tea, oil palm, coffee, cloves, coconut, cinnamon and tobacco. The plantations are spread across Deli Serdang, Langkat, Simalungun, Asahan, Labuhan Batu, and South Tapanuli. These commodities have been exported to various countries and contributed greatly to Indonesia's foreign exchange. In addition to plantation commodities, North Sumatra is also known as a producer of horticultural commodities (vegetables and fruits); For example, Medan Oranges, Deli Guavas, Cabbage Vegetables, Tomatoes, Potatoes, and Carrots produced by Karo, Simalungun and North Tapanuli Regencies.

The Provincial Government (Pemprov) of North Sumatra has also built various infrastructures and infrastructures to facilitate trade both between districts in North Sumatra and between North Sumatra and other provinces. The private sector is also involved by establishing various properties for trade, offices, hotels and others. Of course, other sectors, such as cooperatives, mining and energy, industry, tourism, post and telecommunications, transmigration, and the social sector are also being developed.

In general, in 2008, the situation until the fourth quarter of the economy of North Sumatra grew by 6.97%, higher than the situation in 2007 of 6.90%. Along with the government's continuous economic recovery efforts, North Sumatra's economic performance has shown encouraging developments. By

ISSN 2087-0892

sector, the annual economic growth was driven by the services sector, the transportation and communication sector as well as the financial, rental and service sectors. Meanwhile, in terms of the foreign trade balance, he explained, North Sumatra's exports in 2008 reached 8.56 million tons with a value of US$ 9.27 billion. An increase, when compared to 2007, the export volume was only 7.84 million tons with a value of US$ 7.08 billion. Meanwhile, in terms of imports in 2008, the volume of imports reached 5.67 million tons with a value of US$ 3.59 billion.

Table 1. North Sumatra Economic Growth Rate According to the Field of Business on the Basis of Constant Price 2000

Business field	2005	2006	2007
Agriculture	3.38	2.40	4.98
Mining and excavation	6.42	4.17	9.78
Processing industry	4.76	5.47	5.09
Construction Electricity, Gas and Drinking Water	5.15	3.08	0.22
Trade, Hotel and Restaurant	12.96	10.33	7.78
Financial transportation and communication	4.95	6.95	7.55
Real Estate and Services	10.11	11.91	9.90
Company	7.15	9.90	12.42
services	4.36	7.09	8.25
GDP	5.48	6.20	6.90
GDP without Oil and Gas	5.52	6.26	6.89

Source BPS Province of North Sumatra, Sumatra in Figures 2008

Based on the table above, the structure of the economy since 2005 has shifted from the dominance of the agricultural sector to the mining and quarrying sector. This is indicated by the formation of the Gross Regional Domestic Product (GDP) of North Sumatra on the basis of constant prices which tend to increase slightly. The contribution of the agricultural sector is given by the plantation sub-sector which is the mainstay of North Sumatra. The industrial sector is dominated by the non-oil and gas industry sub-sector, especially the food, beverage and tobacco industries which have a share. Other sectors that play a role in North Sumatra's economic growth are trade, hotels and restaurants, transportation and communication, finance, construction, electricity, gas and drinking water as well as services that contribute to the formation of the Gross Regional Domestic Product (GRDP) of North Sumatra.

3.2 North Sumatra GRDP Development by Business Field

Judging from its contribution, the business sector that gave the largest contribution was the agricultural sector with 23.91% in 2007. While the second sector was the industrial sector with 23.66%. The third sector is the Trade, Hotel and Restaurant sector with 18.42%. This shows that the three sectors have a very large influence on the contribution to the GDP of North Sumatra.

Table 2. North Sumatra Gross Regional Domestic Product by field of business Top Current Price Base (in Billions)

No	Business field	2005	2006	2007
[1]	[2]	[3]	[4]	[5]
1	Agriculture	33486.11	35807.65	41010,15
2	Mining and excavation	171.54	2039.25	2404.92
3	Processing industry	35555.03	41192.51	45531.18
4	Electricity, Gas and Drinking Water	1722.08	1879,86	1897.56
5	Building	8128,89	9400.43	10548.46
6	Trade, Hotel and Restaurant	26094.92	30340,31	34846.21
7	Financial transportation and communication	11783.14	14339.08	16363.69
8	Insurance, Rental Business	8350.74	9725.73	11587.85
9	Building, Land and Company services	12779.87	15651.98	17629,72
	GDP	139618.31	160376.,80	181819,74

Source: BPS Province of North Sumatra, Sumatra in Figures 2008

Table 3. North Sumatra Gross Regional Domestic Product by field of business Top 2000 Constant Price Base

No	Business field	2005	2006	2007
[1]	[2]	[3]	[4]	[5]
1	Agriculture	22191.30	22724.49	23856.15
2	Excavation	1074.75	1119.58	1229.05
3	Processing industry	21305.37	22470.57	23615,20
4	Electricity, Gas and Drinking Water	716.25	738.31	739.92
5	Building	60856.61	5515.98	6559.30
6	Trade, Hotel and Restaurant	15984.93	17095.26	18386.28
7	Transportation and communication Finance Finance, Insurance, Rental Business, Buildings, Land and Services	7379.92	8259,20	9076.56
8	company	5440.50	5977.57	6720.62
9	services	8288	8876.81	9609,20
	GDP	87897.79	93347,40	99792.27

Source: BPS Province of North Sumatra, North Sumatra in Figures 2008

3.3 Transportation Development in North Sumatra

3.3.1 Land transportation

The transportation sector is one of the supports in the economy in addition to the trade sector, financial institutions and services. The transportation sector has a very important role in supporting economic activities and people's lives in an area. Therefore, the development of the transportation sector must be carried out effectively and efficiently so as to facilitate the flow of people, goods, and services as well as information traffic. Apart from that, it is also directed to be able to support economic growth, strengthen national stability as well as equal distribution and distribution of development results by penetrating isolated areas and the backwardness of remote areas. The transportation system has a very important role in supporting national development where transportation is needed to ensure the implementation of the mobility of people and goods between regions. With the availability of a good transportation system, it is hoped that it can support various socio-economic activities of the community to be more effective and efficient.

3.3.2 Water transportation

Tanjung Balai and Pangkalan Susu ports as local feeder ports to serve passenger and goods transportation in the southeastern east coast area. Tanjung Sarang Elang Port was developed as a local feeder port to serve goods transportation in the southern eastern region, so that local commodities are not oriented to Dumai port in Riau province. In general, loading and unloading of goods at North Sumatra ports in 2006 was 6,446.20 tons and increased in 2007 as many as 378,007.64 tons. North Sumatra has 10 ports spread throughout North Sumatra. Ship visits at the port of North Sumatra in 2006 were 26,859 units, while in 2007 there were 29,075. Meanwhile, passengers departing and arriving at the port of North Sumatra in 2007 were 757,949 people. The number of passengers on inter-island sea transportation (domestic) in February 2009 was recorded at 4,236 people, or decreased by 40.85 percent compared to the previous month. Meanwhile, the number of departing passengers in February 2009 was 3,195 people, or decreased by 77.91 percent.

Table 4. Number of Passengers Riding/Downing Through Ports Managed (Commercial)

Year	International	Domestic
	Ups and down	Ups and down
2004	112.151 110,929	296,424 293,526
2005	124 337 91 982	346 356 306 539
2006	101.826 84.592	312,728 271,466
2007	122,362 97,959	312,039 293.263

Source: BPS Province of North Sumatra, North Sumatra in Figures

ISSN 2087-0892

Table 5. Loading and Unloading of Goods Through the Port is Managed (Commercial)

Year	Demolish	Load
	Inter-Island Import	Inter-island Export
2004	1,930,641 8,498,472	5,936,897 1,063,423
2005	2 874 326 8 348 463	5 786 749 1 485 718
2006	2,975,297 8,023,058	6,163,609 1,357,420
2007	3,219,790 8,654,406	5,687,742 1,871,145

Source: BPS Province of North Sumatra, North Sumatra in Figures

From 2004 to 2007, the number of passengers at the port was attempted not to change much, both for domestic and international passengers. Domestic passengers, both boarding passengers and descending passengers, did not experience a significant increase, namely 2.3% and 0.3% each year. Meanwhile, for international passengers, boarding passengers experienced an increase of 4.3% per year. However, the number of passengers decreased by 3.1% per year. This was due to the decrease in air transportation ticket prices which resulted in the shift of users of sea transportation services to air transportation. In addition to falling ticket prices, the shorter time offered by air transportation services to get to their destination is a consideration for service users. Of course this can harm sea transportation services.

3.3.3 Air transport

North Sumatra has 7 airports, one of which is Polonia Airport which is an international airport. Polonia Airport, which is an airport located in the city of Medan, is not only an air transportation infrastructure for the city of Medan but also for North Sumatra. Polonia Airport is an international airport with a land area of 144 hectares, runway length (2,900 x 45) m, domestic terminal area of 7,526 m2 and international terminal 5,570 m2. In 2004 the number of domestic flights only reached 35,906 flights with more than 3.0 million passengers. In 2005 it increased to 46,034. flights with the number of passengers to 3.1 million more passengers.

The number of domestic passengers departing from North Sumatra through Polonia Airport in Medan during February 2009 reached 149,527 people, or decreased by 14.92 percent compared to January 2009, and passengers arriving in North Sumatra also experienced a decrease of 10.52 percent. The number of passengers for overseas (international) destinations reached 28,056 people, or decreased by 10.20 percent compared to the previous month, while the number of arriving passengers reached 26,841 people, or decreased by 32.84 percent.

Table 6. Number of International and Domestic Flights Through Polonia Airport

Year	International	Domestic
	Come Depart	Come Depart
2004	4.139 4.127	17,973 17,933
2005	4,821 4,808	23,041 22,993
2006	4.420 4.425	20,875 20,874
2007	4.170 4.162	22,899 22,926

Source: BPS North Sumatra, North Sumatra in Figures

3.4 Telecommunications Development in North Sumatra

Research conducted recently showed that more than a quarter of Indonesia's population are mobile phone users. From the latest statistical data, currently cellular phone users in Indonesia reach 58.3 million or 26.5 percent of the total population. This figure exceeds the number of PLN electricity customers, namely 36.2 million (15.5 percent of the population), and fixed telephone users, which are 17.8 million (8.1 percent of the population). Even though in the midst of the rapid use of cellular phones, landlines are still popular in the midst of these technological advances, especially in the telecommunications sector.

3.5 Contribution of the Transport and Telecommunication Sector

We can see that the contribution of the transportation and telecommunications sector to the GRDP in North Sumatra from 1988 to 2000 has decreased. This indicates that the contribution of the transportation and telecommunications sectors has decreased compared to the contribution of other sectors. However, from 2001 to 2007 the contribution of transportation and telecommunications has increased. This is due to the increasing level of mobility in North Sumatra, the increasing use of telecommunications services and technological developments, as well as the construction and development of transportation and telecommunications facilities and infrastructure which continues to increase every year.

Table 7. Contribution of the Transportation and Telecommunication Sector Against North Sumatra's GRDP

year	GRDP of the transportation and telecommunications sector	Sumatra's GDP North	Contribution of the transportation and telecommunications sector
1988	689.59	7,907,20	8.72
1989	799.39	9,324.40	8.57
1990	901.39	10,774.79	8.37
1991	1,029.65	12111.55	8.50
1992	1,068.10	14,316.66	7.46
1993	1,628.65	18,215.46	8.94
1994	1,904.71	21,701.00	8.78
1995	2,119.45	24,630.52	8.60
1996	2,323.09	28,173,10	8.25
1997	2,752.20	34,006.27	8.09
1998	3057.64	50,705.97	6.03
1999	3337.00	59,228.08	5.63
2000	3,791.56	68,212.37	5.56
2001	4,429.56	78,501.35	5.64
2002	4,941.96	88.117.50	5.61
2003	5,895.92	96,233.39	6.13
2004	9,478.01	114,647.29	8.27
2005	1,783.14	139,618.31	8.44
2006	14,339.08	160,376,80	8.94
2007	16,363.69	181,819.74	9.00

Source: BPS Province of North Sumatra, North Sumatra in Figures

This increase in contribution is not only due to the level of domestic use of transportation and telecommunications services, but also due to international relations. Because North Sumatra is one of Indonesia's international gateways, which connects Indonesia with Southeast Asian countries (Malaysia, Singapore, Thailand). So that the transportation and telecommunications sectors are very important to be developed, in an effort to increase the GRDP of North Sumatra and also affect other sectors (industry, trade, tourism, and others).

3.6 Analysis Results

In this section, we will look at the role of the transportation and telecommunications sector in the GRDP of the transportation and telecommunications sector of North Sumatra, namely the length of roads and Telkom telephone users. Before that, it will be seen whether the length of the road and whether

ISSN 2087-0892

Telkom telephone users cause/affect GRDP or vice versa. In addition, there will also be testing of the hypotheses that have been made previously at the beginning of this paper as follows: road length and Telkom telephone users have a role in the formation of GRDP in the transportation and telecommunications sector of North Sumatra.

To test the hypothesis above, the Granger Causality test and multiple linear regression analysis with OLS (Ordinary Least Square) analysis technique were used. The calculation process is carried out using the Eviews 5.1 computer program. the regression results obtained are as follows:

1. Unit Root Test and Integration Degree Test

The theoretical basis used in testing the behavior of data on road length and telkom telephone subscribers Unit Root Test developed by Dickey Fuller1979-1981. This test is conducted to see the validity of a data. This test is needed to avoid bias or bias (inefficient). The Unit Root and Degree of Integration Test uses ADF (Augmented Dickey Fuller) statistics for the period 1988 - 2007. The following are the results of the Unit Root Test to see if the data obtained is stationary and we see on the degree or order of difference how many data to be observed will be stationary by using the Degree of Integration Test:

Table 8. ADF Estimation Results and Degree of Integration for Unit Root Test

	Unit Root Test		Degree of Integration
Variable	ADF	Critical Value	Stationary
Road length	-3.280397	-3.029970***	(0)
Telkom Customers	-3.321577	-3.020686***	(0)

Note : * = Significant at = 10%
** = Significant at = 5%
*** = Significant at = 1%

Based on the table above shows that the results of the Unit Root Test for the length of the stationary road are at the degree of integration level or at I(0). This means that the variable length of the path used in this study is stationary at the data level (initial) with a significance level of = 5%. While the variable Telkom telephone subscribers are stationary at the degree of integration level or at I(0) meaning that the Telkom telephone subscribers variable used in this study is stationary at the data level (initial) or I(0) with a significance level of = 5%. This can be seen based on the statistical ADF results obtained for the length of the road -3.280397, while the critical value for the 1% significance level is -3.831511, the 5% significance level is -3.029970 and the 10% significance level is -2.655194. This result shows that the ADF value is greater than the critical value. Thus, it can be concluded that the road length data is stationary.

Then it can be seen that the statistical ADF results obtained for Telkom telephone subscribers are -3.321577, while the critical value for the 1% significance level is -3.808546, 5% is -3.020686 and for the 10% significance level is -2.650413. This result shows that the ADF value is greater than the critical value. Thus, it can be concluded that the interest rate data for Telkom's telephone subscribers is stationary.

2. Granger Causality test (Granger Causality test)

Estimated results of the Granger Causality Test for road length Based on the results of the Granger Causality Test above, it shows that there is a one-way relationship between road length and GRDP in the transportation and telecommunications sectors. This can be seen from the value of F - Statistics. Where Fcount > Ftable (4.16148 > 3.55) is significant at the 5% confidence level, these results indicate that there is a causal relationship between the length of the road to the GRDP of the transportation and telecommunications sectors of North Sumatra. It can also be seen that there is no causal relationship between the GRDP of the transportation and telecommunications sectors and the length of the road where Fcount > Ftable (2.04814 > 3.55) is significant at the 5% confidence level.

Estimated results of the Granger Causality Test for Telkom telephone customersBased on the results of the Granger Causality Test above, it shows that there is a one-way relationship between

Telkom's telephone subscribers and the GRDP of the transportation and telecommunications sectors. This can be seen from the value of F - Statistics. Where Fcount > Ftable (4,39618 > 3.55) is significant at the 5% confidence level, these results indicate that there is a causal relationship from Telkom telephone subscribers to the GRDP of the transportation and telecommunications sectors of North Sumatra. It can also be seen that there is no causal relationship between the GRDP of the transportation and telecommunications sectors and Telkom's telephone subscribers where Fcount > Ftable (4,39618 > 3.55) is significant at the 5% confidence level.

3. OLS . regression analysis results

To test whether the length of the road and Telkom telephone users have a role in the formation of GRDP in the transportation and telecommunications sector, multiple linear regression analysis with OLS (Ordinary Least Square) analysis technique was used. With the following regression results:

The estimation results from the regression results above are: Y = -18.91450+ 1.584108X1 + 0.894272 X2

a. The constant value is -18.91450. This can be interpreted that if there is no change in the length of the road and fixed telephone users, or is considered constant, then the GRDP of the transportation and telecommunications sector in North Sumatra is reduced by 18.91%.
b. The length of the road plays a role in the formation of GRDP in the transportation and telecommunications sector of North Sumatra, this is shown by the X1 regression, which is 1.584108. This means that for every 1% increase in road length, it causes an increase in the GRDP of the transportation and telecommunications sector in North Sumatra by 1.58%, ceteris paribus.
c. Telkom telephone users play a role in the formation of GRDP in the transportation and telecommunications sectors of North Sumatra, this is shown by the X2 regression, which is 0.894272. Finally, for every 1% increase in telephone subscribers, it increases the GRDP of the transportation and telecommunications sector in North Sumatra by 0.89%, ceteris paribus.

4. Coefficient of Determination Analysis (R^2)

Based on the results of the Eviews 5.1 program output, it can be seen that the R-Square value is 0.93 which means that the variables X1 (street length), X2 (Telkom telephone users), together are able to provide an explanation of the GRDP variables in the transportation and telecommunications sectors in Sumatra. North by 93%. While the remaining 7% is explained by other variables not included in the estimation model, or caused by disturbance error.

5. T-Statistic Test

1. Variable path length (X1)

Ha is accepted if t-hit > t-table (α=10%)For the variable length of the road, the t-hit value is 1.849. Thus Ha is accepted, because t-hit > t-table (1.849 > 1.740). It means that it can be concluded that the variable X1 (road length) has a significant (significant) effect on the Y variable (North Sumatra's GRDP of the transportation and telecommunications sector) with a 90% confidence level test.

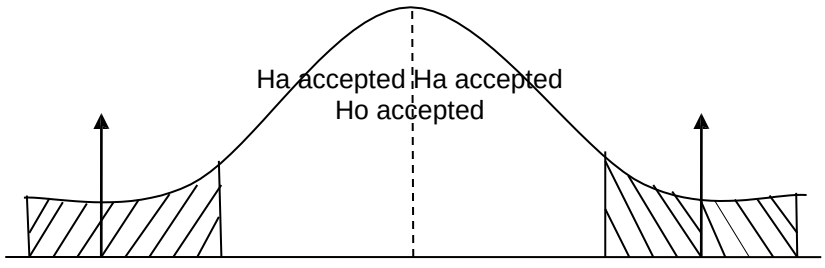

Figure 1. T-statistic test of variable length of the path (X1)

ISSN 2087-0892

2. Telkom telephone user variable (X2)

For the Telkom telephone user variable, the t-hit price is 4,883. Thus Ha is accepted, because t-hit > t-table (4,883 > 2,898). It means that it can be concluded that the variable X2 (Telkom telephone users) has a significant (significant) effect on the Y variable (GDP of the transportation and telecommunications sector of North Sumatra) with a 99% confidence level test.

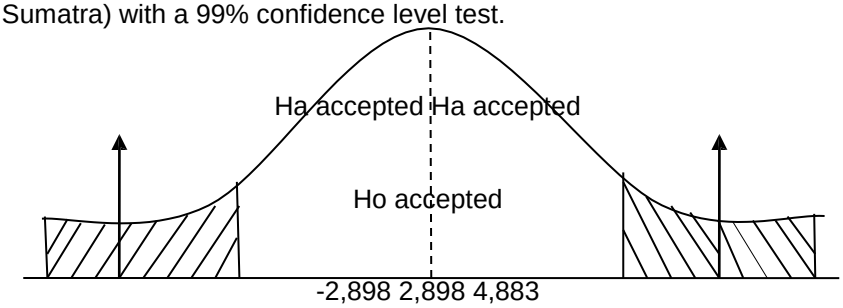

Figure 2. T-statistic test of Telkom telephone user variables (X2)

6. F-Statistic Test

To require the R-Square value mentioned above, then a test is carried out using the F test. The hypothesis is as follows:

Ho =1 = 2 = 0

Ha =1 2 0

That is, based on the available data, 1, and 2 will be tested simultaneously, whether it is equal to zero or not equal to zero, which means that it has a significant effect on the dependent variable. Based on the output of the data regression, the F-hit value was 114.413 with a probability value (significance) of 0.00000. It is based on = 1% with: f1 = k-1 = 2-1 = 1 and f2 = nk = 20-2=18. Thus Ha is accepted, because the value of F-hit > F-table (114.413 > 8.28) and the probability value (significance) is smaller than the value of = 1%. It means that it can be concluded that the variables X1 (road length) and X2 (telkom phone users), have a significant (significant) effect on variable Y (GDP in the transportation and telecommunications sector).

4. Conclusion

Based on the descriptions that have been explained previously, it can be concluded, From the results of the Unit Root Test on the road length variable, it shows that the data is stationary at the zero degree (level)) and the Telkom telephone subscriber variable also shows that the data is stationary at the zero degree (level).). The relationship between road length and GRDP in the transportation and telecommunications sectors shows a one-way relationship, as well as between users telTelkom's epon to the GRDP of the transportation and telecommunications sector shows a one-way relationship. The results obtained from the interpretation of the model indicate that the GRDP of the transportation and telecommunications sector of North Sumatra can be influenced by the length of the road and the number of Telkom telephone subscribers. Both of these variables have a real or significant effect. This can be seen from the t-statistical test that has been carried out on each variable. The coefficient of determination is 0.93, which means that together the variables X1 (street length) and X2 (Telkom telephone customers) provide an explanation variation of 93% for the GRDP of the transportation and telecommunications sectors of North Sumatra. While the other 7% is explained by other variables that are not included in the estimation model.diaccept which means variable X1 (road length) and X2 (Telkom telephone customers) significantly affect the Y variable (GDP of the transportation and telecommunications sector) in North Sumatra at the 99% confidence level.

REFERENCE

[1] S. Hapsa and R. Khoirudin, “Analisis pertumbuhan ekonomi di Yogyakarta tahun 2008-2016,” *J. Ilmu Ekon. dan Pembang.*, vol. 18, no. 2, pp. 151–168, 2018.
[2] A. M. Sikana and A. W. Wijayanto, “Analisis Perbandingan Pengelompokan Indeks Pembangunan Manusia Indonesia Tahun 2019 dengan Metode Partitioning dan Hierarchical Clustering,” *J. Ilmu Komput.*, vol. 14, no. 2, pp. 66–78, 2021.
[3] A. F. Syukri and W. Widiastuti, “Evaluasi Kebijakan Pembangunan Daerah Di Provinsi Jawa Tengah 2019,” *J. Ilmu Adm. Publik*, vol. 6, no. 1, pp. 42–52, 2021.
[4] B. Prasetyo, “Membangun Strategi Pengembangan SDM Transportasi Udara,” *Langit Biru J. Ilm. Aviasi*, vol. 12, no. 3, pp. 43–52, 2019.
[5] M. O. H. K. B. IHSAN, “Pelaksanaan Pemasaran Pada Usaha Rental Mobil Ditinjau Dari Perspektif Ekonomi Islam (Studi Kasus PT. Digital Sarana Transportasi),” 2019.
[6] H. Dwiatmoko, “Peran perkeretaapian dalam menunjang sistem logistik nasional,” *J. Transp.*, vol. 18, no. 2, pp. 87–96, 2018.
[7] F. Siswadhi, C. Carolina, and S. Marselina, “OPTIMALISASI PERAN PEMUDA DALAM PEMBANGUNAN EKONOMI KREATIF BERBASIS SEKTOR PARIWISATA,” *J. Ekon. SAKTI*, vol. 9, no. 1, pp. 170–187, 2020.
[8] B. W. Estanto, “Urgensi holding BUMN dalam peningkatan sektor pelayanan angkutan darat dan udara,” *Masal. Huk.*, vol. 47, no. 2, pp. 89–97, 2018.
[9] D. O. B. Y. M. Putra and R. D. Novianti, “TUGAS SISTEM INFORMASI MANAJEMEN IMPLEMENTASI TELEKOMUNIKASI, INTERNET DAN TEKNOLOGI NIRKABEL PADA PT INDONIC TANGERANG INVESTMENT.”
[10] M. A. R. Simanjuntak and H. Hermanto, “KAJIAN FAKTOR DAN VARIABEL RISIKO KETERLAMBATAN PELAKSANAAN KONSTRUKSI PEMBANGUNAN MENARA TELEKOMUNIKASI PT. XYZ,” *Pros. Snitt Poltekba*, vol. 4, pp. 523–529, 2020.
[11] I. D. Andini, Y. Ruldeviyani, A. H. Maulana, and A. Hidayat, “Penilaian Kualitas Data Broadband Customer Profiling (BCP) Pelanggan Fixed Broadband PT Telekomunikasi Indonesia Tbk.(Data Quality Assessment of Broadband Customer Profiling (BCP) of Fixed Broadband Customer of PT Telekomunikasi Indonesia Tbk.),” *J. IPTEKKOM (Jurnal Ilmu Pengetah. Teknol. Informasi)*, vol. 22, no. 1, pp. 31–43, 2020.
[12] T. Sukwika, “Peran pembangunan infrastruktur terhadap ketimpangan ekonomi antarwilayah di Indonesia,” *J. Wil. dan Lingkung.*, vol. 6, no. 2, pp. 115–130, 2018.
[13] M. A. Sahban and M. M. SE, *Kolaborasi Pembangunan Ekonomi di Negara Berkembang*, vol. 1. Sah Media, 2018.
[14] F. I. Amrina, “ANALISIS PENGARUH TEKNOLOGI INFORMASI, SEKTOR TELEKOMUNIKASI, DAN PENDIDIKAN TERHADAP PERTUMBUHAN EKONOMI PROVINSI JAWA TIMUR.” Universitas Pembangunan Nasional" Veteran" Jawa Timur, 2022.
[15] P. E. D. A. N. P. E. DI, “ANALISIS KAUSALITAS INFRASTRUKTUR TELEKOMUNIKASI, PERTUMBUHAN EKONOMI DAN PEMBANGUNAN EKONOMI DI INDONESIA Annisa Khaira1, Ariusni2.”
[16] P. A. Purnamasari, “Analisis Identifikasi Peranan Sektor Perkebunan dalam Pembangunan Wilayah di Kabupaten Indragiri Hulu periode tahun 2011-2017,” 2019.
[17] H. Hermanto and I. Tani, “ANALISIS RISIKO DAN MITIGASI RISIKO KETERLAMBATAN PEMBANGUNAN MENARA TELEKOMUNIKASI PADA PT. XYZ,” 2021.
[18] V. Anastasya, T. Monica, and R. Rosadah, “Pengaruh Sektor Transportasi dan Komunikasi Terhadap PDRB di Kota DKI Jakarta,” *J. Indones. Sos. Sains*, vol. 2, no. 5, pp. 846–852, 2021.