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

The Effect of Population and Human Development Index on Economic Growth Pematangsiantar City

Darwin Damanik[1], Elidawaty Purba[2], Arnold Sultantio Hutabarat[3]
[1,2]*Universitas Simalungun, Indonesia*
[3]*Institut Bisnis dan Informatika Kesatuan , Bogor, Indonesia*
darwin.damanik@gmail.com

Abstract

The purpose of this study was to analyze the effect of population and human development index on economic growth in Pematangsiantar City, both partially and simultaneously. The type of data used is secondary time series data with a time period of 2004 – 2019. The data analysis technique uses multiple regression analysis with ordinary least squares (OLS). The results showed that partially the population had a significant effect on the economic growth of Pematangsiantar City. The Human Development Index (HDI) has no significant effect on the economic growth of Pematangsiantar City. Meanwhile, simultaneously, the population and the human development index have a significant effect on the economic growth of Pematangsiantar City.

Keywords
economic growth; human development index; population; development planning

I. Introduction

One of the main capital for a country to become a developed country is to have quality human resources. A large and qualified population plays an important role in the development of a country. Population is the number of people who occupy a certain area at a certain time. The population is usually associated with the country's growth (Subri, 2003). One indicator of the success of economic development is economic growth.

Todaro (2003) states that economic growth is an increase in the long-term capacity of the country concerned to provide various economic goods to its population. Based on this, it can be concluded that population is closely related to economic growth in a country. High population growth can affect high economic growth, this can be seen from the high regional GDP, but on the other hand the increase in population growth is a barrier to economic growth. In addition, economic growth is one indicator of the development of a region. Positive and significant economic growth can conclude that development in the area is very good. Economic growth can also describe the level of welfare of a region. With high economic growth, it will make the area a developed area in all aspects (Darma, 2021).

A high level of human development greatly determines the ability of the population to absorb and manage sources of economic growth, both in relation to technology and to institutions as an important means to achieve economic growth (Brata, 2004). Population growth in developing countries is not in line with economic growth, because developing countries such as Indonesia have the characteristics of lack of capital, technology that is still simple, skilled labor is still lacking, and high unemployment rates, therefore population growth is considered an obstacle in economic growth. in Indonesia.

Pematangsiantar City is a city in North Sumatra Province which is one of the largest cities outside after Medan City which is an area close to Indonesia's leading (premium) tourist area, namely the Lake Toba Tourism Area. This city throughout 2004 - 2019 experienced economic growth fluctuating at a rate of 4 - 6 percent, as shown in Figure 1 below:

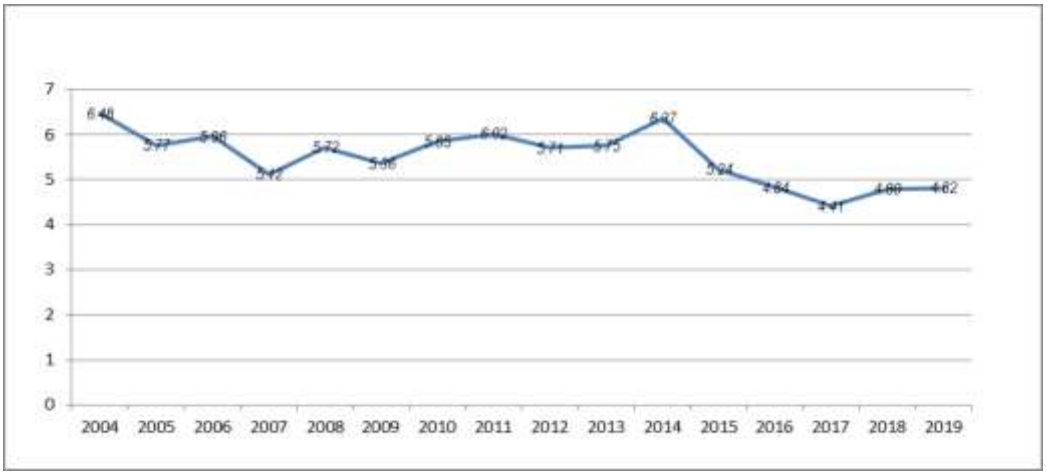

Figure 1. *Economic Growth Rate of Pematangsiantar City*

On the one hand, based on data from BPS Pematangsiantar City, the population of Pematangsiantar City for the period 2004 - 2020 also fluctuated, where the population in 2020 reached 268,254 people with a population density of 3,354 people per km2. This large population can be the basic capital in the development of Pematangsiantar City.

Figure 2. *Population Development of Pematangsiantar City*

Likewise, the development of the Human Development Index (IPM) of Pematangsiantar City from 2004 - 2020 experienced ups and downs, and in 2020 the Human Development Index of Pematangsiantar City was 78.75 and was ranked 2nd among the Regencies/Cities in North Sumatra Province. This illustrates the indicators of the quality of human resources in the creation of development that is able to encourage economic growth in Pematangsiantar City.

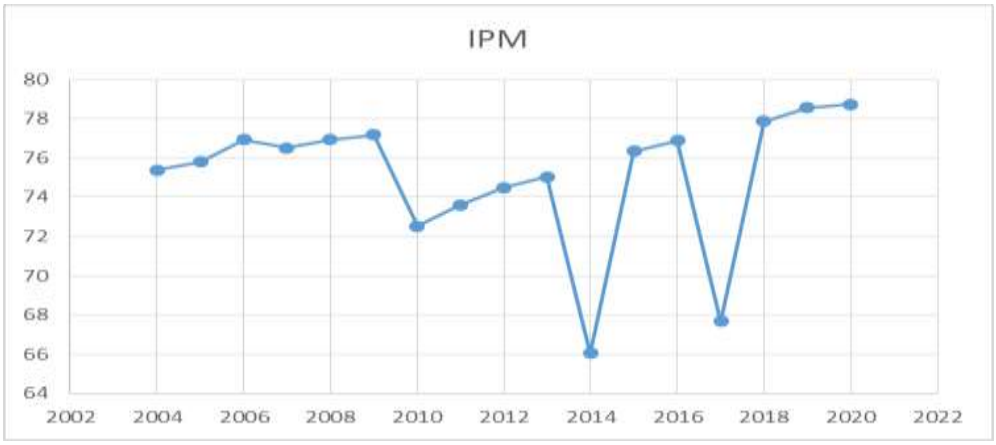

Figure 3. *Development of the Pematangsiantar City Human Development Index*

It has been widely stated that human capital is one of the important factors in the process of economic growth. (Brata, 2002). This is supported by several studies conducted by Maasyirah (2011), Paulus Uppun (2011), Yunita Mahrany (2012), Safitry (2016) which show that human development related to the quality of human capital affects economic growth. The availability of quality human resources is an important requirement for sustainable economic development (Sri, 2010).

Based on these problems, the purpose of this study is to analyze the effect of population and human development index on economic growth in Pematangsiantar City, both partially and simultaneously.

II. Review of Literature

2.1 Economic Growth

The figure of the theory of economic growth is Harrod-Domar whose ideas emerged in 1946 and 1948. In this model the role of physical capital is very large. Population is also considered as a resource but its capacity can increase only if its physical capital also increases. As was the case with Malthus, a large population is also considered to reduce development outcomes because in this model the output is expressed in per capita terms. The difference between this theory and Malthus' theory is that in this theory a large population cannot reduce per capita income if it is balanced with an increase in physical capital. Population is assumed to increase geometrically and full employment always occurs (Nainggolan et al, 2021).

Economic growth is the process of increasing output per capita in the long run (10, 20, or 50 years, or even more). Boediono also emphasized three important aspects of economic growth, namely the process, output per capita, and the long term (Boediono, 2012). Meanwhile, according to Samuelson (1996), economic growth is indicated by an increase in the potential GNP of a country. According to him, the economic growth in question does not only stop the growth of output per capita, but also the growth of real wages and an increase in the standard of living of its people.

Economic growth is an increase in the ability of an economy to produce goods and services. So it can be concluded that the higher the economic growth, the higher the welfare of the community, although there are other indicators, namely income distribution (Nanga, 2005). Economic growth is one of the debatable issue and the most important macroeconomic discussions among macro economists, policy-makers and monetary authorities in all countries. Particularly, whether inflation is necessary or harmful form

economic growth constitutes the basis of the matter in question (Eden 2012). Before 1936, the economic theory was influenced by an idea which says market forces play major role in stabilizing the price of goods and services. According to this thought (classical economic thought), any surplus/deficit output reduces/increase price and maintains stable price. (Wollie, 2018)

Economic growth is a long-term macroeconomic problem where in each period the people of a country will try to increase their ability to produce goods and services. The target is to increase the level of real production (national income) and standard of living (real income per capita) through the supply and mobilization of factors of production. With this increase it is expected to increase capital, production of each worker or in other words will increase foreign exchange reserves. Economic growth can be said as an increase in GDP (Gross Domestic Product) of a country's real in a particular year which shows an increase in per capita income of each person in the economy and in a country in a certain year (Mankiw in Magdalena, 2020)

According to Muta'ali (2015), there are several benefits of economic growth analysis, including to measure economic progress as a result of national development.

a. Develop a typology of regional economic development
b. As a basis for making projections or estimates of regional revenues for sectoral and regional development planning;
c. Knowing the sources of economic growth
d. As a basis for formulating investment needs kebutuhan
e. As a basis for making business forecasts and regional economic targets

2.2 Population

According to Mantra (2010), population is defined as individuals, family members, citizens and a collection of quantities who reside in a place within certain territorial limits. According to Law NO. 23 of 2006, Residents are Indonesian citizens and foreigners residing in Indonesia and Indonesian citizens are native Indonesians and people of other nationalities ratified by law as Indonesian citizens.

Population growth that occurs in a country can cause many population problems, possible problems such as food shortages for the population, lack of job opportunities, housing education and so on. The number of problems related to this population raises awareness to overcome problems related to the development of the population. The development of the world's population always fluctuates, nothing is the same in all countries, even regions in a country. The decrease or increase in population in a country has a close development with the technology owned by that country. The higher the level of technology owned by a country, the wider the possibility to increase production output and the wider the available jobs. The number of jobs can affect population development (Purba et al, 2021).

According to Jhingan (2004) Rapid population growth puts pressure on land, and causes unemployment. Not to mention the problem of providing food which is enormous. Even the need to prepare infrastructure tends to divert state spending away from productive assets. It is increasingly difficult to provide adequate educational and social facilities. The explanation above tells that large or high population growth if not careful will be able to suck per capita income.

2.3 Human Development Index (HDI)

The quality of human resources is an important component in every development movement. Only high-quality human resources can accelerate the nation's development. A large population, if not followed by adequate quality, will only become a burden for development. Population quality is the state of the population both individually and in groups based on the level of progress that has been achieved (Nainggolan et al, 2021).

A high level of human development greatly determines the ability of the population to absorb and manage sources of economic growth, both in relation to technology and to institutions as an important means to achieve economic growth (Ramirez, 1998). Human development is the embodiment of the long-term goals of a society and places development around humans, not humans around development (Mahrany, 2012).

Human Development Index (HDI) or Human Development Index (HDI) which is a standard measure of human development. This index is formed based on four indicators, namely 1) life expectancy, 2) literacy rate, 3) the average length of schooling and 4) purchasing power. The life expectancy indicator represents the dimensions of long and healthy life (the health dimension), while the literacy rate indicator and the average length of schooling reflect the output of the knowledge dimension (education dimension). The indicator of purchasing power (income) is used to measure the dimensions of a decent life (UNDP, 2004).

III. Research Methods

The type of data used in this study is secondary data. This secondary data is time series data (periodic data) with a period of 2004-2019 obtained from the Central Statistics Agency (BPS) of Pematangsiantar City. The data needed in this study include: 1) Data on Economic Growth in Pematangsiantar City, 2) Population data in Pematangsiantar City, and 3) Data on HDI figures in Pematangsiantar City. The method used in this research data collection is through documentation. Documentation is a method of collecting data based on documents, literature studies, scientific journals, and other written reports related to population and HDI and economic growth. The data analysis technique is descriptive analysis and multiple linear regression analysis with the ordinary least square model, where the functions are as follows:

Economic Growth = f (Total Population, Human Development Index)

Then the functional is transformed into a regression model as follows:

Y= a+b1x1+b2x2+et

Where:

Y = economic growth
A = constant
$ß_1, ß_2$ = regression coefficient
X_1 = population
X_2 = HDI
Et = error term

Furthermore, the results of these calculations carried out classical assumption testing, hypothesis testing and discussion.

IV. Results and Discussion

4.1 Classic Assumption Test

The use of the Ordinary Least Square (OLS) assumption in estimating a multiple regression requires the fulfillment of several assumptions, namely the classical assumption: Gauss-Markov (Ariefianto, 2012). Classical assumptions in this study include autocorrelation, multicollinearity, data normality, and heteroscedasticity.

a. Normality Test

Data normality is related to the distribution of a data. Data that has a normal distribution means data whose distribution is perfectly symmetrical.

Table 1. Normality Test

One-Sample Kolmogorov-Smirnov Test

		Standardized Residual
N		16
Normal Parameters, b	mean	.0000000
	Std. Deviation	.93094934
Most Extreme Differences	Absolute	.136
	Positive	.136
	negative	-.074
Test Statistics		.136
asymp. Sig. (2-tailed)		.200c,d

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.
Source: Data processed, 2021.

Based on the normality test with the Kolmogorov-Smirnov test, the test statistic value of 0.136 and Asymp Sig of 0.200 is greater than = 0.05, so it can be concluded that the data is normally distributed.

b. Multicollinearity Test

This test is used to determine whether there is a relationship between the independent variables in the study. If there is a relationship between variables, then there is a problem called multicollinearity. The test results can be seen in the table below:

Table 2. Multicollinearity Test

Model		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)					
	Total population	-.742	-.734	-.722	.908	1.101
	HDI	-178	.073	.049	.908	1.101
a. Dependent Variable: Economic Growth						

Source: Data processed, 2021

Based on the output above, it can be seen that: The tolerance value of all independent variables is greater than 0.10 and the VIF value of all independent variables is less than 10.00. Based on the above values, it is concluded that there is no multicollinearity in the three variables (Population Number, Human Development Index and Economic Growth).

c. Heteroscedasticity Test

This test is used for test which assesses whether there is a variance inequality of the residuals for all observations in the linear regression model. The test results can be seen in the image below:

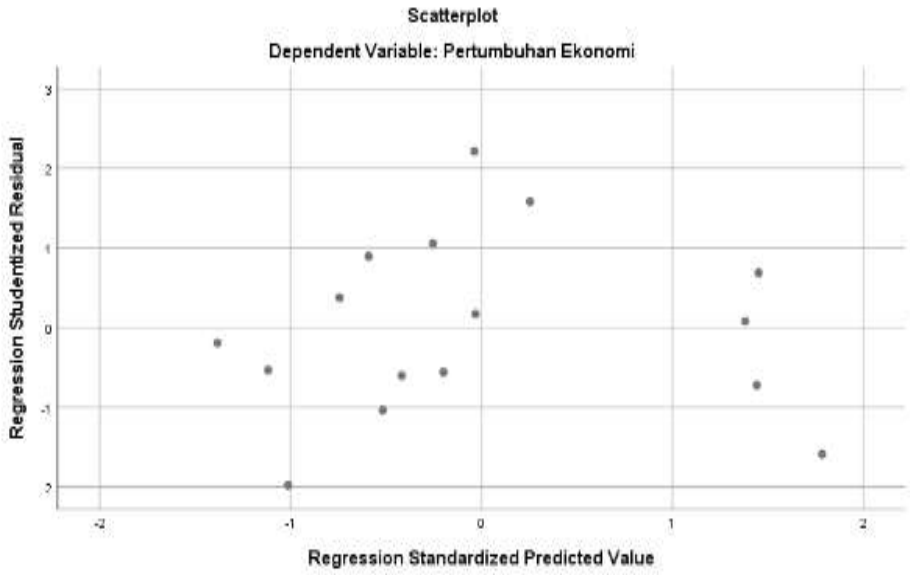

Figure 1. *Heteroscedasticity Test*

Based on the scatterplot display, it can be seen that the plot spreads randomly above and below zero on the Residual Studentizad Regression axis. Therefore, based on the Heteroscedasticity test using the graphical analysis method, the regression model that was formed stated that there were no heteroscedasticity symptoms.

d. Autocorrelation Test

Autocorrelation test to determine whether there is a correlation of variables in the prediction model with changes in time.

Table 3. Autocorrelation Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	.744a	.553	.484	.48944	1.568	
a. Predictors: (Constant), HDI, Population						
b. Dependent Variable: Economic Growth						

Source: Data processed, 2021

The Durbin-Watson value in the table is 1.568. This value means that there is no autocorrelation in this regression model.

e. Hypothesis Test

Based on the results of hypothesis testing conducted for this study, the following results were obtained:

Table 4. Hypothesis Test Results

Test Type	Model	df	Mean Square	F	Sig.
F Uji test	Regression	2	1,927	8044	.005b
	Residual	13	.240		
	Total	15			
	Variable	**Unstandardized**	**Standardized**	**t**	**Sig.**
t test	(Constant)	250,561		4.022	.001
	Total Population (X1)	-19.794	-.758	-3,894	.002
	HDI (X2)	.010	.051	.264	.796
	R Square (R2)		**Adjusted R Square (Adj. R2)**		
Coefficient of Determination	.553		.484		

Source: Data processed, 2021

According to Ariefianto (2011), the coefficient of determination shows the proportion of variation in the dependent variable (y) which can be explained by variations in the independent variable (x). The value of R2 always lies between 0 and 1. R2 is a measure of model fit (model fit). The R2 value is 0.553, thus the variation in the population variable and the human development index explains 55.30% of the variation in the economic growth of Pematangsiantar City, the remaining 44.70% is explained by other variables outside the model.

Based on the results of the F statistical test as a simultaneous test in table 4 above, it can be seen that the value of sig. of 0.005 where this value is smaller than the error level (error) of 0.05 so it can be concluded that the population variable (X1) and the Human Development Index (X2) simultaneously affect the economic growth variable in Pematangsiantar City (Y).

Likewise, the t statistical test or partial test produces the data in table 4, while from these results it can be concluded as follows:

1. The population variable (X1) has a t-stat value of -3.894 with a sig value. of 0.002, which means that the population variable (X1) has a negative and significant effect on the economic growth of Pematangsiantar City.
2. The Human Development Index (X2) variable obtained a t stat value of 0.264 with a sig value. of 0.796 which means that the human development index variable (X2) has a positive and insignificant effect on the economic growth of Pematangsiantar City.

4.2 The Effect of Population on Economic Growth

The results of the partial test (t test), that the population (X1) obtained the t-count value from the output for the birth rate of 19,794> 2,178, then H0 was rejected and H1 was accepted, then H0 was accepted and H1 was rejected. This means that the population variable (X1) has a significant effect on the economic growth of Pematangsiantar City.

Judging from the sign of the coefficient with a negative sign (-) it means that there is a negative relationship between the population and economic growth, this indicates that: (1) High population growth will also lead to more consumption needs than the need for investment. Existing resources are simply allocated more to the growth of a high labor force than to be contributed to increasing capital for each workforce. This will cause slow

labor absorption in each business field and will increase unemployment; (2) High population growth will cause a high dependency ratio, which will reduce the level of public saving, where the development of the population dependency ratio of Pematangsiantar City in 2019 was 49, 16, which means that every 100 people of working age have 49 dependents who are not yet productive and are no longer considered productive; (3) High population growth will also result in high labor force growth, where this labor force cannot be fully absorbed in Pematangsiantar City.

The results of this study are also the same as the results of the research of Fitriani et al (2012) and Sholikah (2020) who concludes in his research that the population has a significant effect on economic growth.

4.3 The Effect of Human Development Index on Economic Growth

The results of the partial test (t test), that the Human Development Index (X2) obtains the t value of the output for the HDI of 0.264 < 2.178, then H0 is accepted and H1 is rejected. This means that the X2 variable has a positive and insignificant effect on economic growth in Pematangsiantar City. It is obtained from the positive and insignificant regression results that the human development index is not significant to economic growth in Pematangsiantar City. The human development index is an indicator used to measure the degree of human development, namely the literacy rate, the average length of schooling, and per capita expenditure. The existence of a positive relationship between human development and economic growth, the policy of equitable distribution of human development must be a concern of the Government. So that the human development index is an important factor in stimulating the economic growth of a region. However, increasing the human development index in Pematangsiantar City has not been able to have a significant impact on the development of economic growth in Pematangsiantar City. The Human Development Index (HDI) of Pematangsiantar City in 2019 was 78.75. Every year it has increased and is always ranked 2nd among regencies/cities in North Sumatra Province, this is a proud development capital for Pematangsiantar City. The Human Development Index (HDI) of Pematangsiantar City in 2019 was 78.75. Every year it has increased and is always ranked 2nd among regencies/cities in North Sumatra Province, this is a proud development capital for Pematangsiantar City. The Human Development Index (HDI) of Pematangsiantar City in 2019 was 78.75. Every year it has increased and is always ranked 2nd among regencies/cities in North Sumatra Province, this is a proud development capital for Pematangsiantar City.

The results of this study are also the same as the results of Safitri's research (2019) who concludes in his research that the Human Development Index has no significant effect on economic growth.

V. Conclusion

Based on the research results that have been described, the following conclusions can be drawn: partially, the Population Number variable (X1) has a significant effect on Economic Growth in Pematangsiantar City, while the Human Development Index variable (X2) has no significant effect on Economic Growth in Pematangsiantar City; Simultaneously, the Variable Population Number (X1) and Human Development Index (X2) have a significant effect on Economic Growth in Pematangsiantar City; Based on the results of the coefficient of determination (R2), it is only 0.553 that 55.30% of the economic growth rate that occurs in Pematangsiantar City can be explained by using the variable population and the Human Development Index. While the remaining 44.

Suggestion

Pematangsiantar City Government needs to control the population of Pematangsiantar City because the results of this study state that the population has a negative relationship (influence) on economic growth. So controlling the population is very important in order to achieve the economic growth desired by the Pematangsiantar City Government; Pematangsiantar City Government needs to increase the Human Development Index of Pematangsiantar City. The improvement in HDI is carried out properly accompanied by the addition of a number of activities in the form of training, quality education, and health so as to increase productivity in the future which will later encourage the economic growth rate of Pematangsiantar City.

References

Ariefianto, Moch Doddy. (2012). Ekonometrika: Esensi dan Aplikasi Dengan Menggunakan Eviews. Jakarta: Penerbit Erlangga.

Badan Pusat Statistik Kota Pematangsiantar. (2004-2020). Kota Pematangsiantar Dalam Angka. Pematangsiantar:Badan Pusat Statistik (BPS).

Boediono. (2012). Teori Pertumbuhan Ekonomi, Edisi Pertama. Yogyakarta: BPFE.

Darma, Budi. (2021). Pengaruh Jumlah Penduduk Terhadap Pertumbuhan Ekonomi Kabupaten Tebo Tahun 2016 – 2020. Citra Ekonomi Volume 2 No.1 Mei 2021.

Fitriani, Nurul, Theresia Militina, dan Aji Sofyan Effendi (2012). Pengaruh Faktor Demografi dan Investasi Swasta Terhadap Pertumbuhan Ekonomi Kota Samarinda. Jurnal Ekonomi Pembangunan Volume 10 Nomor 01.

Jhingan, M.L, (2004). "Ekonomi Pembangunan dan Perencanaan", Terjemahan oleh D. Guritno, Edisi ke-1, Cetakan ke-10, PT. Raja Grafindo Persada, Jakarta

Magdalena, S and Suhatman, S. (2020). The Effect of Government Expenditures, Domestic Invesment, Foreign Invesment to the Economic Growth of Primary Sector in Central Kalimantan. P. 1692-1703

Mahrany,Yunita.(2012). Pengaruh Indikator Komposit Indeks Pembangunan Manusia terhadap Pertumbuhan Ekonomi di Sulawesi Selatan. Skripsi : Sarjana Fakultas Ekonomi dan Bisnis Universitas Hassanudin, Makassar.

Mantra, Ida Bagoes (2010). Demografi Umum. Yogyakarta: Penerbit Pustaka Pelajar.

Muta'ali, Lutfi. (2015). Teknik Analisis Regional Untuk Perencanaan Wilayah Tata Ruang dan Lingkungan. Yogyakarta: Badan Penerbit Fakultas Geografi (BPFG).

Nainggolan, Lora et al. (2021). Ekonomi Sumber Daya Manusia. Medan: Yayasan Kita Menulis.

Nanga, Muana. (2005). Makro Ekonomi : Teori, Masalah, dan Kebijakan. Jakarta: PT Grafindo Persada.

Purba, Bonaraja., Arfandi SN., et al. (2021). "Ekonomi Demografi." Medan: Yayasan Kita Menulis.

Ramirez, A. G. Ranis, and F. Stewart. 1998. Economic Growth and Human Capital. QEH Working Paper No.18.

Safitri, Eva Rahayu. (2019). Analisis Pengaruh Indeks Pembangunan Manusia, Upah, Inflasi, Kemiskinan Dan Jumlah Penduduk Terhadap Pertumbuhan Ekonomi Di Jawa Tengah Tahun 2013-2017. Skripsi: FEB UMS.

Sholikah, Imroq Atus. (2020). Pengaruh Jumlah Penduduk, Belanja Daerah, Kemiskinan, Angkatan Kerja, Pengangguran, Indeks Pembangunan Manusia dan Angka Harapan

Hidup Terhadap Pertumbuhan Ekonomi Kabupaten/Kota di Provinsi Jawa Timur Tahun 2014-2018. Skripsi: FEBI IAIN Tulungagung.
Samuelson, A Paul & William D Nordhaus. (1996). Makro Ekonomi Edisi 14. Jakarta: Penerbit Erlangga.
Subri, Mulyadi. (2018). Ekonomi Sumber Daya Manusia: Dalam Perspektif Pembangunan. Jakarta: Rajawali Pres.
Sukirno, Sadono. (2016). Ekonomi Pembangunan. Jakarta: Penerbit Raja Grafindo.
Suswita, Intan et al. (2020). Pengaruh Infrastruktur terhadap Pertumbuhan Ekonomi di Kabupaten Simalungun. Jurnal Ekuilnomi Volume 1 No.2.
Wollie, G. (2018). The Relationship between Inflation and Economic Growth in Ethiopia. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). P. 264-271.