ANALYSIS OF THE EFFECT OF THE DEMOGRAPHIC BONUS ON ECONOMIC GROWTH IN NORTH SUMATRA 2015-2021

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Abstract

This study aims to determine whether the Demographic Bonus affects Economic Growth in North Sumatra Province. Annual data related to the Demographic Bonus from 2015 to 2021 is used. The method used in this study is multiple linear regression method. This type of research is descriptive quantitative with secondary data obtained from the Central Bureau of Statistics of North Sumatra Province. The results of the study found that the variable Labor Force Participation Rate has a positive and significant effect on economic growth in North Sumatra, this is due to when there is an increase in the labor force in North Sumatra balanced with an increase in job absorption. And the Dependency Ratio has a positive and significant effect on economic growth.

Keywords: Demographic Bonus, Economic Growth, North Sumatra

INTRODUCTION

Demographic bonus is a state in which there are structural changes in population aging that cause demographic changes, such as decreases in birth rates and death rates. As the birth rate declines, so does the number of 15-year-olds. This increases the working-age population between 15-64 years the number of births in the past. Meanwhile, due to the improvement in health and life expectancy is increasing and with it also the number of elderly people is also increasing.

The period when the working-age population significantly exceeds the non-working-age population. This has a productive effect on maintenance relationships, where the financial burden lies that the productive population has to pay to the unproductive population and productivity bottoms out. At that time, the maintenance rate was less than 50 percent. This means that between the productive population (working age) and the population does not want to work about 2 times.

The consequences of this demographic transition, where the number of productive people increases more than the unproductive population, have implications for economic benefits. Because when the burden of dependence is very low, there is an increase in the number of workers who if all are absorbed in the available job opportunities it will increase the total output obtained. With all working-age residents working, there will be a greater accumulation because all working workers are able to increase their savings. This savings will be more meaningful if invested in productive activities. In addition, this large workforce can be improved through special investment policies.

Demographic Bonus which is when the country of Indonesia has a large number of young/productive age population, which is about 2/3 of the total population. The demographic bonus can be seen from the Depedency Ratio parameter which is quite low, reaching 44. This means that in every 100 unproductive population (15-64 years old) only about 44 unproductive residents bear. Data from the Central Bureau of Statistics (BPS)

Indonesia in 2010 shows Indonesia's Depedency Ratio of 50.5. While in 2015 the Depedency Ratio had a smaller number of 48.6. This Depedency Ratio figure is getting smaller again from 2020 to 2030, which will create a demographic bonus for Indonesia.
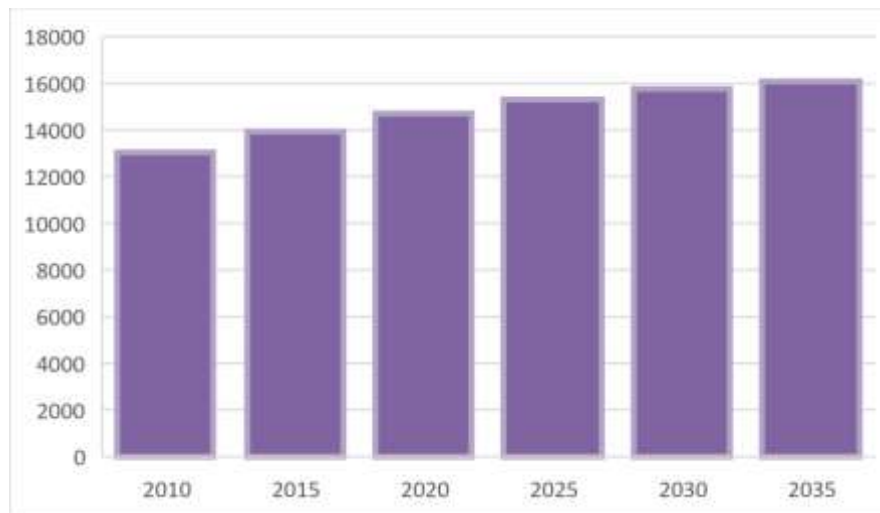
Graph 1. North Sumatra Population Projection, 2010-2035
Source : Bank Indonesia, Economic Report of North Sumatra Province, 2022

Based on the data above, it is known that the population of North Sumatra Province continues to increase. Based on BPS data, the population projection of North Sumatra in 2010 was 13028.70, then within 5 years in 2015 it increased by 13937.80, in 2020 it increased by 14703.50, in 2025 it increased by 15311.20, in 2030 it increased by 15763.70, until in 2035 it increased by 16073.40.

Population projection is not a population forecast but a scientific calculation based on the Dependency Ratio assumption of the components of the population growth rate, namely births, deaths, and displacement. These three components determine the size of the population and the age structure of the population in the future. To determine each assumption requires data that describes trends from the past to the present, the factors that influence those components, and the relationship between one component and another and the target expected to achieve the Dependency Ratio in the future.

The existence of this demographic bonus will have an impact on the dependency ratio of abundant labor availability but very low labor absorption will increase the number of unemployed. North Sumatra Province needs to respond to this demographic bonus by expanding employment opportunities, so that the labor force can be well absorbed. The demographic bonus experienced by North Sumatra Province is an opportunity to increase North Sumatra's economic growth. Based on this, the author is interested in conducting research entitled Analysis of Demographic Bonus on Economic Growth in North Sumatra Province in 2015-2021.

The purpose of this study is to determine and analyze the effect of dependence ratio on economic growth and the effect of labor force participation rate on economic growth in North Sumatra.

LITERATUR REVIEW

Demographic Bonus

Demographic bonus refers to a situation where a country has a large population in the productive age group or a relatively higher labor force compared to the number of individuals in the unproductive age group, such as children and the elderly. The demographic bonus occurs due to a decrease in birth rate and an increase in life expectancy that causes a shift in the demographic structure of a country.

The demographic bonus has the potential to provide economic benefits if put to good use. Some of the impacts that can occur are as follows: First, Economic Growth: Demographic bonuses can give a boost to a country's economic growth. A large labor force can increase production and productivity, resulting in an increase in national income and consumption.

Second, Community Welfare: Demographic bonuses can improve people's living standards due to increased income and consumption. More resources are available for investment in health, education, infrastructure, and other sectors of the economy.

Third, Human Development: With the demographic bonus, the country has the opportunity to invest resources in education and training for the young workforce. It can improve the quality of the workforce, reduce the skills gap, and improve innovation and technological capabilities.

Demographic Bonus Management Strategy: To optimize the potential of demographic bonus, countries need to implement appropriate strategies and policies. Some strategies that can be applied are:

1. Increased Labor Force Participation:
   Encourage labor force participation, especially women and young people, through inclusive employment policies, training programs, and gender equality in access to employment opportunities.
2. Investment in Education:
   Improve access and quality of education, including formal education and vocational training, to prepare the workforce with skills relevant to labor market needs.
3. Increased Productivity
   Encourage innovation, investment in technology, and development of growing sectors of the economy to increase productivity and competitiveness.
4. Family and Health Policy
   Strengthen policies that support family welfare, such as family leave policies, reproductive health services, and social protection, to ensure conditions that support healthy and productive families.

There are several important factors that explain the relationship between demographic bonuses and economic growth, namely labor supply, the role of women, savings, and human capital.

1. Labor Supply: The demographic bonus occurs when the number of productive labor forces exceeds the number of dependents. However, a large enough labor supply needs to be supported by adequate employment opportunities. If there are not adequate employment, the unemployment rate can increase significantly, which can hinder economic growth.
2. Women's Role: Women play an important role in birth control through their participation in family planning programs. By participating in this program, a prosperous life expectancy can be realized. Women tend to choose to have fewer but qualified children, so that they can participate in the job market. Through women's participation in the workforce, the potential demographic bonus can be better utilized.

3. Savings: The demographic bonus provides an opportunity to increase national savings. With a low dependency ratio, the economic burden resulting from government spending on health, education, and social care can be reduced. This allows for an increase in people's savings, which in turn can be used for investment in infrastructure development and other productive sectors, boosting economic growth.
4. Human Capital: The quality of human capital is an important key in utilizing demographic bonuses. By having quality human capital, such as good education and skills, the workforce can be more efficient and productive. This will support sustainable economic growth, as an educated and skilled workforce is able to make good use of employment opportunities.

By paying attention to these factors, the government and the public can optimize the positive impact of demographic bonuses in encouraging sustainable economic growth.

Theory of Economic Growth:

Economic growth theory provides a framework for understanding the factors that influence a country's economic growth. The foundation of this theory explains that high labor force participation can increase output and productivity, while a low dependency ratio can reduce the burden on the economy and increase savings and investment. In the context of demographic bonuses, this theory can be used to estimate its impact on economic growth.

Economic growth refers to the process of increasing per capita output sustainably over the long term. Economic growth is an indicator of successful development and is generally associated with improving people's welfare. However, there are other factors that are also important to consider, such as an even distribution of income.

Gross Domestic Product (GDP) is a measure of total national income and expenditure on the output of goods and services within a country. GDP is often considered the best indicator to measure the performance of a country's economy. The main purpose of GDP is to summarize overall economic activity in terms of a given value of money over a period of time, usually in one year.

High economic growth usually indicates an increase in the production of goods and services, which in turn can increase national income. The increase in national income is expected to bring benefits to society as a whole, such as an increase in wage levels, a decrease in the unemployment rate, an increase in access to public services, and an improvement in the quality of life.

However, it is important to remember that high economic growth does not always automatically have a positive impact on people's well-being. Unequal distribution of income can lead to social and economic inequality, where most of the benefits of economic growth are enjoyed by certain segments of society. Therefore, it is important to pay attention to income distribution and take appropriate measures to ensure that economic growth provides equitable benefits to the entire society.

Dependency and Dependency Theory:

This theory deals with the effect of dependency ratio on economic growth. The dependency ratio measures the number of dependents (children and elderly) in a population compared to the amount of the productive labor force. This theory argues that a high dependency ratio can result in a heavy economic burden, as it increases government spending in health, education, and social care. Therefore, a low dependency ratio can positively affect economic growth. The Dependency Ratio measures the ratio between the number of children (ages 0-

14) and the number of parents (ages 65 and over) to the working-age population (ages 15-64). This ratio can be divided into two, namely the Dependency Ratio of young residents and the Dependency Ratio of older residents. The young population Dependency Ratio describes the number of children aged 0-14 years per 100 population aged 15-64 years, while the Elderly Population Dependency Ratio describes the number of elderly people aged 65 years and over per 100 residents aged 15-64 years.

The Dependency Ratio provides a potential indication of how changes in the age structure of the population may affect social and economic development. Because this ratio links groups that may become economically dependent groups with groups that may be economically active, it can be used to determine social support needs. Through the Dependency Ratio, it can be known which group is more dependent on workers, whether the group of children is more dominant or the group of elderly population is more dominant. Thus, the establishment of social support policies can be more focused and targeted.

A high Dependency Ratio indicates that economically active populations must face a greater burden to support and provide the social services needed by children and the elderly population who are economically dependent on them. The high Dependency Ratio of the young population also has implications for higher investment needs.

The Dependency Ratio is also sensitive to changes in fertility rates. As fertility decreases, the Dependency Ratio will decrease as the proportion of children becomes less while the proportion of the working-age population increases. This period is known as the window of opportunity and demographic dividend, in which the number of potential producers increases relative to the number of consumers. However, if the fertility rate continues to decline, the Dependency Ratio will increase again because the proportion of the working-age population will begin to decline and the proportion of the elderly population will increase. As the elderly population increases and the Dependency Ratio increases, it will be necessary to increase investment in social security and public health systems.

Labor Force Participation Theory
The theory of labor force participation includes factors that affect the level of labor participation in an economy. These factors include employment policies, education levels, employment opportunities, and social factors. This theory states that increased labor force participation can make a positive contribution to economic growth by increasing production and national income.

The labor force participation rate refers to the percentage of the working-age population involved in the labor force. The labor force participation rate gives an idea of the potential work-ready population. The potential of the population to work will be high if the number of labor force is also high, which means the number of individuals who are not in the labor force is low.

Some of the factors that affect labor force participation rates include age, gender, and job opportunities. In terms of age, the labor force participation rate is influenced by the number of individuals of productive age who are still in education, so work is not a major obligation for them. Meanwhile, in terms of gender, women are often prioritized to take care of the household, which results in women's work participation rates being lower than men's. In addition, employment opportunities also affect the labor force participation rate. The labor force participation rate can reflect the magnitude of available job opportunities. Great job opportunities can encourage an increase in people's income and create prosperity.

In the economic context, there is a cycle in which the absorption of labor in the non-agricultural sector that does not reduce the absorption of labor in the agricultural sector will create a surplus of labor that can be used in other sectors. This can change the structure of the economy and potentially improve people's welfare.

Overall, labor force participation rates are influenced by factors such as age, gender, and job opportunities. Understanding labor force participation rates is important in analyzing the available labor force and economic potential of a country.

RESEARCH METHODS

This type of research is quantitative descriptive research. According to Mudrajat Kuncoro (2007), descriptive research is a collection of data to test hypotheses or answer questions about the last status of research subjects. The purpose of quantitative research is to develop and use mathematical models, theories, and hypotheses related to other phenomena. This research is a combination of descriptive and quantitative.

This study used secondary data. The data is in the form of a timeseries with a period of 2015 to 2021. Data obtained by the Central Statistical Agency (BPS), the internet, journals, and literature related to this study, namely data on the population of North Sumatra Province, economic growth data, and data on labor force participation in North Sumatra Province from 2015 to 2021. The data was analyzed using multiple linear regression methods to test hypotheses with statistical analysis tools in the form of EViews Version 10 software. The reason for choosing to use this multiple linear regression analysis method is that it is adjusted to the purpose of this study, which is in addition to testing the influence of dependent variables on independent variables. Testing is considered feasible or free from violations of classical assumptions so that test results can be interpreted correctly.

Regression analysis is carried out regarding multiple regression. Its formulation is as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + e_i$$

Because there are differences in units, the above equation is measured into natural logarithms, which are as follows:

$$\text{Ln } Y = \text{Ln}\beta_0 + \beta_1 \text{Ln} X_1 + \beta_2 \text{Ln} X_2 + e_i$$
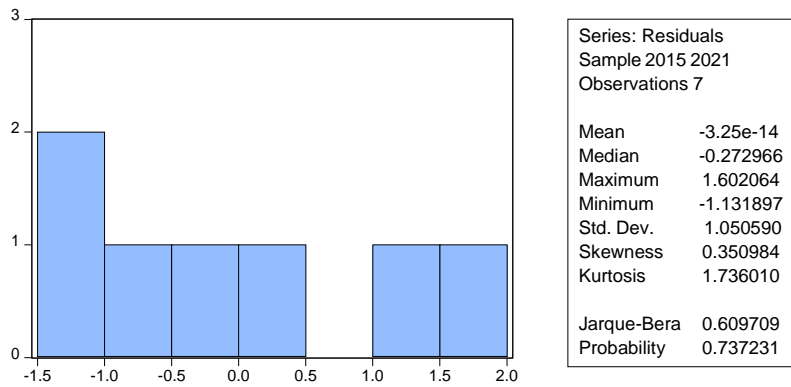
Where:

Y	= Economic Growth
$\beta_1, \beta_2, \beta_3$	= Regression Coefficient
X1	= Labor Force Participation Rate
X2	= Dependency Ratio
α	= Constant
Ei	= Error Term

RESEARCH RESULTS

The following are the results of data processing from the effect of the Demographic Bonus on Economic Growth in North Sumatra Province in 2015-2020:

1. Classical Assumptions
   a. Normality Test

Series: Residuals	
Sample 2015 2021	
Observations 7	
Mean	-3.25e-14
Median	-0.272966
Maximum	1.602064
Minimum	-1.131897
Std. Dev.	1.050590
Skewness	0.350984
Kurtosis	1.736010
Jarque-Bera	0.609709
Probability	0.737231

In the normality test results, it is known that the average data is negative with the median data at -0.272. The maximum value of the data is 1.60 and the minimum value of the data is -1.13. In the estimated results of the Normality test, the jarque-bare value is smaller than 2, which is 0.609 and at a probability value greater than 5%, which is 0.737231. This indicates that the test is normally distributed or has no normality problems.

b. Heteroscedacity Test

Heteroskedasticity Test: White

F-statistic	0.778939	Prob. F(4,2)	0.6291
Obs*R-squared	4.263357	Prob. Chi-Square(4)	0.3715
Scaled explained SS	0.512306	Prob. Chi-Square(4)	0.9723

The results of the heteroscedacity test above show an Obs*R-Squared value of 4.263357 and a value at a probability of 0.3715 (greater than 5%) so that it can be concluded that there is no heteroscedasticity.

c. Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	9.886479	Prob. F(2,2)	0.0919
Obs*R-squared	6.357001	Prob. Chi-Square(2)	0.0416

The results of the Autocorrelation test above show an Obs*R-Squared value of 6.357001 and a value at a probability of 0.0416 (smaller than 5%) so that it can be concluded that there is a problem in autocorrelation.

d. Multicollinearity Test

Variance Inflation Factors
Date: 05/25/23 Time: 05:16
Sample: 2015 2021
Included observations: 7

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	10964.06	46356.56	NA
TPAK	0.113166	2269.376	1.459796
DEPENDENCY	0.000260	34203.44	1.459796

Judging from the data above, there is no correlation between independent variables that have multicollinearity problems because the VIF value has a value of less than 10. So it can be concluded in this model there is a problem of Multicollinearity.

Results of multiple linear regression analysis

Based on the hypothesis proposed there are 2 (two) explanatory variables that affect Economic Growth (dependent variables), namely: Labor Force Participation Rate and Dependency Ratio, In this regression analysis a backward method is used, where in this method in the initial test, all independent variables are included in the test and then removed one by one if they do not meet the significance value t below 0.05, In the resulting output table will be shown the process / stages when the variable is removed, each row will be equipped with a number indicating the stages / processes carried out, In the discussion of this chapter, it will only be discussed in the last row / last process in each table, this is intended because in each last row is the last test result which is a variable that has a significance value t below 0.05.

Dependent Variable: LPE
Method: Least Squares
Date: 05/25/23 Time: 05:14
Sample: 2015 2021
Included observations: 7

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-312.3796	104.7094	-2.983300	0.0406
TPAK	0.577837	0.336401	1.717701	0.1610
DEPENDENCY	0.049620	0.016133	3.075697	0.0371

R-squared	0.702824	Mean dependent var	4.032857
Adjusted R-squared	0.554235	S.D. dependent var	1.927198
S.E. of regression	1.286705	Akaike info criterion	3.639574
Sum squared resid	6.622441	Schwarz criterion	3.616392
Log likelihood	-9.738508	Hannan-Quinn criter.	3.353057
F-statistic	4.730008	Durbin-Watson stat	2.072534
Prob(F-statistic)	0.088314		

Source : BPS, Data processed Eviews 10

Based on the results of the data processing above, a regression model is formulated as follows:

Y= -312.3796 + 0.577837X1 + 0.049620X2

Information:
   X1 = Labor Force Participation Rate
   X2 = Depedency Ratio
    Y = Economic Growth
The above equation can be interpreted as follows:

The value of the coefficient of the negative directional constant indicates the negative influence of the independent variable between (X1 and X2). The meaning of the coefficients of b1 and b2 from the variables above, it was found that the value of the coefficient of regression of the Labor Force Participation Rate variable was 0.577837, meaning that every increase in the increase of the Labor Force Participation Rate by 1 unit, it decreased by 0.577837 / unit. The value of the coefficient of regression of the Dependency Ratio variable is 0.049620, meaning that every increase in the number of Dependency Ratios by 1 unit, the poverty rate will increase by 0.049620 / unit.

DISCUSSION

Based on the hypothesis testing above, several things can be explained related to the influence of each independent variable (bebaas) on dependent variability (bound), among others: The Effect of Labor Force Participation Rate (X1), Depedency Ratio (X2) on Economic Growth (Y) in North Sumatra Province, Partial t-Test Value or individual-individual variables Labor Force Participation Rate and Depedency Ratio has a significant effect on the economic growth of North Sumatra province.

Based on the results of regression analysis that has been carried out shows that the variable Labor Force Participation Rate has a positive and significant effect on economic growth in North Sumatra, this is because when there is an increase in the labor force in North Sumatra balanced with an increase in job absorption, the unemployment rate will decrease and economic growth will increase and vice versa if the Labor Force Participation Rate is not well absorbed, unemployment is increasing and economic growth is declining,

The Dependency Ratio has a positive and significant effect on economic growth. This is due to the low quality of education owned by the productive age population, income levels that tend to be low, limited availability of jobs, and higher birth rates. size. Low income can cause health problems, sanitation, difficulty in meeting their needs, and the welfare of the population of unproductive age must be borne by the young population. owned by the young population

The high birth rate causes the burden to be borne by the productive age population to be even greater. Limited employment opportunities trigger unemployment problems, causing many productive age residents to be unable to bear the burden of living for productive age and non-productive age residents. The results of this study are in line with the findings of Chandra pakpahan 2019, which suggests that the dependency ratio has a positive and significant effect on economic growth.

The labor force is a population over the age of 15 years and is said to be a productive age population who has the ability to produce an item and obtain profits and is able to meet the needs of life, Absorption of labor is a lot of people who are absorbed to work in companies or agencies, absorption of labor will accommodate available labor if jobs are available and balanced with the number of workers, Large and large population growth will have a tendency to bring slow economic growth if it cannot overcome the labor force that cannot be absorbed into employment, If the population and labor have quality it will produce a quality and good labor force as well.

CONCLUSION

Based on the discussion that has been discussed , conclusions can be given from the results of the regression analysis that has been carried out as follows, The Labor Force Participation Rate has a positive and significant influence on economic growth in North

Sumatra. It shows that when the labor force increases and is offset by an increase in employment, the unemployment rate decreases, and economic growth increases. Therefore, it is important to continue to encourage labor force participation and create adequate jobs and The Dependency Ratio also has a positive and significant effect on economic growth. This is related to various factors such as low quality of education, low income, limited employment, and high birth rate. To increase economic growth, special attention needs to be paid to improving the quality of education, increasing income, and controlling the birth rate.

The advice that can be conveyed by the author is that efforts to improve the quality of education in North Sumatra need to be a priority. Investing in better education will improve the skills and competitiveness of the workforce, which in turn can lead to better jobs and higher economic growth. In order to achieve sustainable economic growth in North Sumatra, it is important to integrate policies that support higher labor force participation, as well as address issues related to dependency ratios. This will help create a more stable and sustainable economic environment for the people of North Sumatra.

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