Study on the Ratio of Dependence of Non-Productive Age Population to Productive Age Population in West Nusa Tenggara, Indonesia

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ABSTRACT: This paper aims to analyze and examine the level of dependence of the non-productive age population on the productive age population. There are two age categories of non-productive age population, namely the age of 0-14 years called the young age group, and the age category of 65 years and over. This study is a quantitative descriptive research, using secondary data in the form of raw data about productive age population and non-productive age population. Data analysis using the dependency ratio formula in total, young age, and old age. Data sources from the Central Bureau of Statistics and related institutions. The research was conducted in West Nusa Tenggara Province for the 2013-2022 time period (according to data availability). The results of the analysis / study showed that in total for the initial seven years, the burden of dependence was in the category of moderate dependence (85 percent of the total DR was the burden of youth), while for the last three years it has been in the low dependency category. Partially young age, indicating the burden of dependents is in the low category, as well as for old age is in the category of low dependent burden.

KEYWORDS: Population growth, Dependency Ratio

I . INTRODUCTION

An understanding of population is important for private and government institutions both at the national and regional levels. Plans related to education, taxation, military, social welfare, housing, agriculture, and enterprises; companies that produce goods and services, jal; an, hospitals, shopping centers, and recreation centers will be more appropriate if they all refer to population data (Wirosuharjo, 2000). Furthermore, if you want to know how fast a country's economic development is, it can be seen from the growth of employment, the concentration of the population in the economic sector. As for seeing an increase in living standards can be seen in the average life expectancy of the population, because the length of life a person lives in the country is still the best measure.

Population growth is a dynamic balance between the forces that increase and decrease population. Continuously the population will be affected by the number of births (increasing the population), but at the same time will also be reduced by the number of deaths that occur in all age groups. Meanwhile, population mobility also plays a role in increasing and decreasing the number of population with in-migration and out-migration.

In general, the population can be viewed from two aspects. First, according to Adam Smith's theory, population can be viewed as an asset, which means that population is one of the factors of production that is useful in running the wheels of the economy that can create prosperity. According to Smith, rapid population growth is considered capable of encouraging economic growth, increasing population will expand the market, and market expansion will increase the level of specialization in the economy (Arsyad 2010) Second, population as a burden. The role of the population in this case as a subject of development that must be prospered. Population growth, low quality of human resources, and narrow employment opportunities can increase unemployment and the age of dependence of the population. Therefore, demographic factors can be inhibiting factors or as driving factors that affect economic growth is indisputable. So the demographic aspect has a close relationship with economic growth.

High population growth will result in changes in the age structure of the population characterized by an increase in the proportion of children under the age of 15 years accompanied by a slow increase in the proportion of the elderly population. Changes in age structure that occur affect the dependency ratio, which is the ratio between the population of non-productive age

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unproductive age to the population of productive age, which shows the magnitude of the burden of dependence of the population. A high dependency ratio with an increasing tendency is an inhibiting factor for the economic development of a region. Arsyad (2010), the rapid population growth rate in developing countries causes the proportion of immature population to increase and the number of family members to increase. As a result, the burden of dependency ratio, which is a comparison between people who have not been / unable to work with people who are within the age limit participate in the production process. The lower dependency ratio indicates the lower burden borne by productive people to finance unproductive and unproductive populations, Indirectly, with the high dependency ratio that occurs is not balanced with the supply of employment, it will have an impact on poverty due to the high population, the number of menpower who increase every year so that the burden of dependence increases due to problems with economic development that cause employment gaps and the number of poverty,

The Dependency Ratio can be used as an indicator to roughly show the state of a country's economy, both developed and developing countries. The degree of dependence is one of the important demographic indicators. The higher the percentage of dependence, the greater the burden that must be borne by the productive population to provide for the unproductive and unproductive population. Although the percentage of dependency ratio is low, this shows that productive people have a smaller burden to fund unproductive or no longer productive residents (Hidayat, 2021).

The Dependency Ratio is the ratio between the population group aged 0-14 years who are included in the economically unproductive population group and the population group aged 64 years and over who are included in the population group who are no longer productive and the population group aged 15-64 years who are included in the productive group. The dependency ratio also shows the resident population of productive activities carried out by the working-age population. The productive age population is the population aged 15 to 64 years which is also called the menpower. The dependency ratio shows that the higher the dependency ratio number indicates the greater the burden that must be borne by the productive age population because part of the income is used to finance the lives of unproductive and unproductive residents (Mantra, 2000). Furthermore, said Mantra (2000), the dependency ratio is influenced by several factors, such as birth rate, death rate, migration, and economic factors such as economic growth, interest rates, and inflation. The higher the birth rate and the lower the death rate, the higher the dependency ratio. From these descriptions, it encourages researchers to conduct a study on the level of dependence of non-productive age residents on productive age residents in West Nusa Tenggara Province.

II. LITERATURE REVIEW

Dependency Ratio or Dependent Expense Ratio is a number that expresses the ratio between the number of non-productive age population (population under 15 years old / young population and population aged 65 years or more / old population) with the number of productive age population (population aged 15 to 64 years). The Dependency Ratio shows the burden that must be borne by the productive age population to the non-productive age population. The higher the percentage of Dependency Ratio indicates the higher the burden that must be borne by productive people to finance the lives of non-productive residents. Conversely, if the lower the percentage of Dependency Ratio, the lower the burden on productive people to bear the non-productive age population (Central Statistics Agency, 2023).

Dependency ratio is a ratio between the number of non-productive age population (0-14 and 65+ years) with the number of productive age population (15-64 years). The higher the dependency ratio illustrates the heavier the burden borne by the productive age population because they have to spend part of their income to meet the needs of the non-productive age population, and vice versa (Panggabean, 2020). This is in line with Kurniasari's (2016) view which explains that the dependency ratio is an important indicator to describe a country's economic condition and distinguish whether the country is developed or developing. A high percentage dependency ratio indicates a large burden that must be borne by the productive population to finance the non-productive population. Conversely, a low dependency ratio indicates a lower burden for productive people to finance unproductive populations. Calculating the dependency ratio in macro can be done by certain methods

The dependency ratio is an important indicator that reflects the age structure of the population and has a major influence on a country's economy and social policies. Managing dependency ratios is a challenge for governments, and requires effective long-term strategies. If managed well, The burden of high dependency ratios can be minimized, and countries can benefit from their demographic structure (United Nations, 2019). It was further explained that, increasing the dependency ratio does not mean that the country will definitely experience economic difficulties. Other factors, such as productivity level, education level, and technology, It also plays an important role in the economic strength of a country. To that end, it is important for policymakers to consider these factors when formulating strategies for the future.

Bintarto (2004), the dependency ratio or dependency burden figure reflects the amount of dependents of the productive age group on the non-productive age population. The productive age ranges from 15 to 64 years and is considered productive

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because in this age range it is estimated that people can still work, both in the private sector and as Civil Servants. Meanwhile, the unproductive age includes residents aged 65 years and over, where it is considered no longer productive to work. Dependency figures provide information about how much each person who is already employed has to bear the burden of people who are not yet or are not working. By looking at this number or index of dependent expenses, we can assess how much prosperity a country or region has. Dependency Ratio can also be an indicator of the economic progress of a region. When the dependency ratio is high, economic growth is disrupted or people's income is low, while if the dependency ratio is low, it can trigger high economic growth because most of the income is used to invest and save, provided that all productive ages work productively (Panggabean, 2020). Soegimo (2009), the level of population dependence can be classified into three groups based on the dependency rate. . The low dependency ratio is characterized by a number less than 30, while the medium group has a ratio between 31 to 40. On the other hand, high dependency can be recognized by a number greater than 41. This classification gives a rough idea of how much of a dependent burden the productive age population has on the non-productive age population in a population.

Young residents or residents under the age of 15 years are considered unproductive residents because they are still economically dependent on their parents or other people who bear it. Similarly, residents aged 65 years or older are considered unproductive because they have passed the working retirement period. Residents aged 15 to 64 years, are working-age residents who are considered productive and have economic potential in development. The dependency ratio measures the economic and social burden of the productive population on the dependent population (children and the elderly). This theory emphasizes the importance of understanding the demographic structure of the population and how changes in the age composition of the population can affect labor and social policies (Rafi and Pahlevi, 2020).

The higher the dependency ratio number indicates the greater the burden that must be borne by the productive age population because part of the income is used to finance the lives of unproductive and unproductive residents (Mantra, 2000). According to Arsyad (2010), the rapid population growth rate in developing countries causes the proportion of immature population to increase and the number of family members increases. As a result, the burden of dependency ratio, which is a comparison between people who have not been / unable to work with people who are within the age limit participate in the production process. The lower dependency ratio indicates the lower burden borne by productive people to finance unproductive and unproductive populations, Indirectly, with the high dependency ratio that occurs is not balanced with the supply of employment, it will have an impact on poverty due to the high population, The number of labor force that increases every year so that the burden of dependence increases due to problems with economic development that cause employment gaps and the number of poverty.

Based on the theory of population cycle - poverty (Todaro & Smith, 2020) states that population growth that is too fast can have a negative economic impact, especially in developing countries. An increase in births will increase the burden of dependency and exacerbate economic, social and psychological problems related to underdevelopment and poverty. High dependency ratio leads to increased poverty (Vijayakumar, 2013).

The existence of demographic changes affects the economy of the population. Bloom (Zulkarnain 2022) stated that the age shift has a major impact on the performance of the national economy, , particularly on employment opportunities and savings rates. This indicates that the shift from productive age to non-productive age population will affect the number of people absorbed in employment opportunities. Vijayakumar (2013) states that dependency ratio affects poverty in countries in Asia, Latin, and Sub-Saharan Africa. This is because human resources are an important factor in the national economy.

III. RESEARCH METHODS

This type of research is descriptive research, aimed at describing things that are currently in force. In it there are efforts to describe, record, analyze, and interpret conditions that now occur or do not occur (Sugiyono, 2010). The data used in this writing are secondary data in the form of data on the productive age population (15-64 years), and data on the non-productive age population, namely the age group 0-14 years and the age of 65 years and over.

Dependency ratio is one of the demographic indicators used to measure the burden of unproductive populations on productive populations. The dependency ratio is calculated by dividing the number of unemployed people (generally the age group under 15 years and over 65 years) by the number of productive age population (generally aged 15-64 years) and the result is multiplied by the constant 100. The formula for calculating the dependency ratio is as follows: DR = (number of unproductive age population / number of productive age population) x 100%. Or Dependency Ratio = ((Number of Elderly Population + Number of Children) / Number of Population in Working Age) x 100.

There are 3 types of dependency ratios:
1. Child dependency ratio
2. Aged dependency ratio

3. Total dependency ratio with better known as dependency ratio.

$$DR = \frac{P_{(0-14)} + P_{(65+)}}{P_{(15-64)}} \times 100$$

DR = Dependency Ratio (Rasio Ketergantungan)

$P_{(0-14)}$ = Jumlah penduduk usia muda atau belum produktif (0-14 tahun)

$P_{(65+)}$ = Jumlah penduduk usia tidak produktif atau tua (65 tahun ke atas)

$P_{(15-64)}$ = Jumlah penduduk usia produktif (15-64 tahun)

DR muda = {(Po-14)/P15-64} x k
DR tua = {(P65+)/P15-64} x k
Percentage of young DR to total DR = young DR/total DR x 100%
Percentage of old DR to total DR = old DR/total DR x 100%

Information:
- P(0-14) = Number of young or unproductive population (0-14 years)
- P(65+) = Number of non-productive or elderly population (65 years and over)
- P(15-64) = Number of productive or old age population (15-64 years)
- k = Constant (100)
- DR muda = Young DR
- DR tua = Old DR
- DR = Dependency Ratio

The dependency ratio is categorized into 3, namely:
• High dependent burden if it has a value of ≥ 70
• Moderate dependent burden if it has a value of 51 – 69
• Low dependent burden if it has a value of ≤ 50

The dependency ratio can vary depending on birth rates, mortality rates, and migration rates. However, the dependency ratio is more easily affected by the birth rate. he low birth rate causes the population structure to change to more productive age. This shift then becomes a demographic bonus (Faelassuffa, 2022).

IV. DISCUSSION

Total Dependency Ratio

The population dependency ratio is a comparison between the number of people aged 0-14 years plus the number of people aged 65 years and over compared to the number of people aged 15-64 years or can be interpreted as a comparison of productive residents with non-predictive residents (according to national working age indicators). The structure of the population is distinguished by working age, can be classified as follows:
a. Population under working age (aged 0-14 years)
b. Population of productive age or menpower (aged 15-64 years)
c. Population over working age (age 65 years and over)

The working-age population can be referred to as the productive age, thus the combination of the population under the working age and the population above the working age who are considered as non-productive population, Based on this classification, the dependency ratio can be measured which shows the ratio between the number of unproductive people (people under working age and above working age) with productive age population.

A high dependency ratio can hinder the development of developing countries, including Indonesia, because part of the income of the productive group must be used to meet the needs of the group that has not produced or produced it. When the population is small, it is easier to mobilize government funds and budgets for productive investments. In the case of a low dependency ratio, food and other raw materials can be stored and high-quality residents can live, thereby increasing the life expectancy of the area.

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In line with the changes that occur in the three main components of population growth between births, deaths and displacement, the structure of the population according to age changes. Thus the dependency ratio will also change over time.

Table 4.1 Results of West Nusa Tenggara Dependency Ratio Calculation 2013-2022

Year	DR Young / (%)	DR Old /(%)	DR Combined Young and Old /(100%)
Dependecy Ratio (DR) of West Nusa Tenggara Province 2013-2022			
2013	47,91/ (86,87)	7,24 /(13,13)	55,15 (100,00)
2014	46,67 /(86,30)	7,38 /(13,70)	54,08 (100,00)
2015	46,26 /(86,11)	7,479 /(13,89)	53,72 (100,00)
2016	45,80 /(85,80)	7,585 /(14,20)	53,38 (100,00)
2017	45,34 /(85,48)	7,71 /(14,52)	53,04(100,100)
2018	44,91/ (85,12)	7,85 /(14,88)	52,76 (100,00)
2019	44,47 /(84,72)	8,01/ (15,28)	52,49 (100,00)
2020	41,13 /(84,53)	7,53 /(15,47)	48,66 (100,00)
2021	39,33 /(84,45)	7,23 /(15,55)	46,57 (100,00)
2022	36,93 /(80,56)	8,91 /(19,44)	45,84 (100,00)

Source: Central Bureau of Statistics West Nusa Tenggara, 2023

In 2013, the dependency ratio was 55.15, meaning that there were about 55 unemployed out of every 100 people employed. Throughout the time interval shown, the ratio showed a consistent decline until it reached 45.84 in 2022, which shows a decrease in the burden of the non-working population on the employed. This decrease signifies that the proportion of the population in the labor force has increased or that the proportion of those considered dependent (both younger and older) has decreased, which can be interpreted as increased economic independence or demographic changes such as decreased birth rates or increased employment opportunities for older populations. This data is important for social and economic planning, as it provides insight into the demographic structure and potential economic pressures on society.

Young Age Dependency Ratio in West Nusa Tenggara

The ratio of young dependence is the ratio of the population aged 0-14 years with the number of people aged 15-64 years. From the calculation results, it shows a decrease in the ratio of dependence of young people to productive age population. This shows the lower burden that must be borne by the productive age population in financing the lives of the unproductive population. They are not productive at the age of 0-14 years because they have not entered the working age category (Working age in Indonesia is 15-64 years).

The calculation results show that in 2013, the dependency ratio was at 47.91 which means that 100 productive people bear as many as 47 to 48 unproductive people. It has decreased until the end of the 2022 analysis period of 36.93, which means that out of 100 people of productive age, 36 to 37 people of non-productive age are covered.

The Dependency Ratio will be lower if the proportion of non-productive age population decreases and/or the proportion of productive age population increases. Conversely, the dependency ratio will be higher if the proportion of non-productive age population increases and/or the proportion of productive age population decreases. Thus, the growth of the productive age population that is faster than the growth of the unproductive population provides an opportunity to obtain a decreased dependency ratio.

Old Age Dependency Ratio in West Nusa Tenggara Province

Based on the calculation results in Table 4.1, it shows that the dependency ratio of old age (65 years and over) has an increasing trend, but is far below the dependency ratio of the young population. Data from the beginning of the analysis, the dependency ratio is 7.24 which means: out of 100 productive age residents will bear as many as 7 productive age residents aged 65 years and over. Until the latest year data, the analysis showed a slight increase, namely to 8.92, which means there are 8 to 9 people of old non-productive age borne by 100 people in the productive age category. And this shows the burden of the dominant young age dependency rate in the high total dependency burden.

Referring to the dependency ratio criterion: The dependent burden is high if it has a value of ≥ 70; Moderate dependents if they have a value of 51 – 69; Low dependent burden if it has a value of ≤ 50, So it can be concluded that the ratio of dependence of young and old is at the level of low dependents. Meanwhile, in total, it is in the range of medium and low dependent expenses. Young population or populationunder the age of 15 years are considered unproductive residents because they are still

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economically dependent on their parents or other people who bear it. Similarly, residents aged 65 years or older are considered unproductive because they have passed the working retirement period. Population ranging from 15 to 64 years old, are working-age population who are considered productive and have economic potential in development. From the calculation results that can be seen in Table 4.1, it shows that the dependency ratio of the young population dominates the amount of the number in the calculation of the total dependency rate which can be seen in the numbers in brackets the percentage is on average above 80 percent, even in the first five years, the percentage is above 85 percent

CONCLUSION

1. The dependency burden ratio of the young population over the time period of the analysis shows that it is at a low dependent burden.
2. The ratio of dependents of the elderly population during the analysis period showed to be at a low (even very low) dependent burden.
3. In total, the dependency expense ratio shows conditions that were at moderate levels at the initial seven years, and at low levels for the last three years of the analysis period.
4. The dependence of the young population (0-14 years) is higher than the dependence of the elderly population (65 years and over) on the productive age population of 16-64 years). The results of the analysis showed that the percentage of young dependency ratio (young DR) was higher than the percentage of old dependency ratio (old DR)

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