

## POPULATION DYNAMICS

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### Abstract

*Demography is writings about people or human population. Demography is also known as population science, which is the science that studies the dynamics of human population. Demography comes from a combination of Greek words, namely demos meaning people or population, while graphein means writing or records. Demography studies the population, the most important of which is studying fertility or birth, mortality or death and mobility. Population affects the economic growth of a region. Population plays an important role in the economy with rapid growth throughout the world. Population growth will have a major impact on the country's economy, as is the case in developing countries including Indonesia. The implications of population size, development, and quality are very important to consider in planning for proper economic development in the future. Population dynamics are conditions in which the population structure, number, and distribution change due to demographic processes such as birth, death, and migration. Population growth, according to Lucas, Donald & Young (1990), is influenced by three main elements, namely fertility (birth), mortality (death), and migration. The fertility rate has a positive effect on population growth or increases the population, while the mortality rate has a negative effect or reduces the growth rate.*

**Keywords:** Demography, Population, Population Growth.

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## I. Introduction

Demography writings about people or human population (Harry & Harmadi, n.d.). Demography is also known as population science, which is the science that studies the dynamics of human population. (Harry &

Harmadi, n.d.) Demography comes from a combination of Greek words, namely *demos* meaning people or population, while *graphein* means writing or records. (Harry & Harmadi, n.d.) Demography studies the population, the most important of which is studying fertility or birth, mortality or death and mobility (Clavijo-Núñez et al., 2024).

Population affects the economic growth of a region. Population plays an important role in the economy with rapid growth throughout the world. (Harry & Harmadi, n.d.) Population growth will have a major impact on the country's economy, as is the case in developing countries including Indonesia. (Harry & Harmadi, n.d.) The implications of population size, development, and quality are very important to consider in planning for proper economic development in the future. (Harry & Harmadi, n.d.) Population dynamics are conditions in which the population structure, number, and distribution change due to demographic processes such as births, deaths, and migration. Population growth, according to Lucas, Donald & Young (1990), is influenced by three main elements, namely fertility (births), mortality (deaths), and migration. (Harry & Harmadi, n.d.) The fertility rate has a positive effect on population growth or increases the population, while the death rate has a negative effect or reduces the growth rate (Kerschbaumer et al., 2024).

Population dynamics refer to the changes in population size, composition, and distribution over time, influenced by factors such as birth rates, death rates, migration, and socio-economic conditions. Understanding population dynamics is essential for policymakers, researchers, and governments as it affects resource allocation, economic development, and social structures. Rapid population growth in some regions can lead to increased demand for food, water, housing, and healthcare, while population decline in others may result in labor shortages and economic stagnation. The study of these dynamics helps societies plan for sustainable development and address demographic challenges (Osei & Owoo, 2024).

One of the key aspects of population dynamics is the demographic transition, a theory that explains how populations shift from high birth and death rates to lower ones as societies develop. In developing countries, high fertility rates and declining mortality rates contribute to rapid population growth, which can strain resources and infrastructure. Conversely, in developed nations, lower birth rates and aging populations pose challenges such as increased healthcare costs and pension burdens. Migration also plays a crucial role, as people move between regions or countries in search of better economic opportunities, affecting labor markets and urbanization trends (wang et al., 2024).

Managing population dynamics requires well-planned policies that address both growth and decline effectively. Governments must invest in education, healthcare, and job creation to balance population growth with economic sustainability. Family planning programs, improved healthcare services, and social policies that support aging populations are essential in maintaining demographic stability. By understanding and responding to population changes, societies can ensure long-term development, economic stability, and improved quality of life for their citizens (Charlier et al., 2024).

## **II. Literature Review**

### **2.1. Understanding population dynamics**

Population dynamics is a condition where the structure, number and distribution of a population changes due to demographic processes: births, deaths and migration. To determine the population, regions (governments) usually collect population data through censuses, population registration, and population surveys (Jerumeh, 2024).

### **2.2. Demographic transition theory**

Demographic change or transition is a condition that describes changes in demographic parameters such as birth rates, death rates, and migration. (Harry & Harmadi, n.d.) Zelinsky (1971) stated that fertility and mortality transitions are vitality transitions, and demographic transitions consist of vitality transitions and mobility transitions (Bezgrebelna et al., 2024).

### **2.3. Population Growth**

Population growth is a phenomenon that certainly occurs in a region or country and affects the population over time. (Fiska R, 2024) Changes in population over time affect the organization of a country. (Fiska R, 2024) Therefore, every country is required to monitor or pay attention to the growth of its territory. (Fiska R, 2024) If population growth is uncontrolled or unmonitored, then population growth can disrupt the stability of the country, because the country is not ready to face the phenomenon. (Fiska R, 2024)

### **2.4. Demographic bonus**

Demographic bonus is the acceleration of economic growth as a result of a decline in mortality and fertility rates in a country and is a subsequent

change in the age structure of a population. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) With a smaller birth rate each year, the number of people under productive age will grow smaller when compared to the working age population. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

Demographic bonus is the potential economic benefit that a country obtains because the proportion of its productive population is greater than its unproductive population. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

The demographic bonus is defined as an economic benefit caused by the increasing amount of savings from the productive population, which can trigger investment and economic growth. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

### **III. Methodology**

This study uses several methods, the first is the theory of population dynamics, the theory of demographic transition, population growth, population dynamics include changes in the number and composition of the population influenced by three main factors: Birth: Calculated through crude and general birth rates, Death: Calculated using crude and age-specific death rates, Migration: Includes internal and international movements, which can increase or decrease the population, and to determine the demographic bonus and its implications.(Fiska R, 2024) Analysis of these dynamics is important for development planning and resource management.(Fiska R, 2024)

### **IV. Results and Discussion**

#### **A. Understanding population dynamics**

Population dynamics is a condition where the structure, number, and distribution of a population change due to demographic processes: births, deaths, and migration. (Cipta et al., n.d.) Demography is also a change in the state of a population. These changes are influenced by several factors, both qualitative and quantitative. (Cipta et al., n.d.) Dynamics and changes are likely to affect the development of the population of a country or region. (Harry & Harmadi, n.d.) The number of residents can be known through

censuses, registrations, and population surveys. (Cipta et al., n.d.) Population dynamics comes from two words, namely dynamics and population. (Cipta et al., n.d.) In the Big Indonesian Dictionary (KBBI), dynamics is movement (from within) or the power that moves or enthusiasm. (Cipta et al., n.d.) Meanwhile, according to KBBI, population means one or more people who live in a place (village, country, island, etc.). (Cipta et al., n.d.)

Based on the understanding of the two words dynamics and population, the understanding of population dynamics "Population dynamics is a movement and growth of people or people who are influenced by various things that occur in an area and occur from time to time. (Cipta et al., n.d.) Along with its development, the population in an area is different from the population in other areas. (Cipta et al., n.d.) Some areas experience rapid population growth and high population density, while other areas experience less rapid population growth, causing population shortages. (Cipta et al., n.d.) Population density or shortages have a significant impact on regional growth in terms of health, economy, education, income, and others. (Cipta et al., n.d.) Therefore, each region must have adequate and clear population data to encourage growth. (Cipta et al., n.d.) Regional development can run optimally and it is easy to find solutions to current problems. (Cipta et al., n.d.)

To determine the population, regions (governments) usually collect population data through censuses, population registration, and population surveys. (Cipta et al., n.d.)

#### 1. Population Census

A census is a calculation or collection of population data, economic levels, and others carried out by a government within a certain period of time. Usually, a census is carried out every 10 years in years ending in zero, such as 2020, 2010, and 2000 and others. (Cipta et al., n.d.) A census conducted by a country can take full advantage of the needs and interests of the country as well as the country's fiscal situation. (Cipta et al., n.d.)

#### 2. Population Registration

Population registration is an activity carried out by a government in the form of registration or data collection with the aim of recording events that occur in a society and can affect the lives of the community itself. Unlike the census, population registration continues to be carried out as long as events occur in society. (Cipta et al., n.d.) Various events occur in society, such as births, deaths, divorces, marriages, relocations, and adoptions. (Cipta et al., n.d.) Residents who experience these events must report them or register with government agencies that collect population data. In this way, the country receives accurate population data. (Cipta et al., n.d.)

### 3. Population Survey

Population Survey is an activity that aims to improve the results of the census and population registration. (Cipta et al., n.d.) Why do we need to improve the results of the census and population registration? The information provided by these two activities needs to be added, because these two activities have limitations in providing information. (Cipta et al., n.d.) In Indonesia, the Central Statistics Agency conducts population surveys such as the National Economic Survey, the National Labor Force Survey (SAKERNAS), and the Intercensal Population Survey (SUPAS). (Cipta et al., n.d.) Although the population survey is limited, the census still provides complete, comprehensive, and detailed information. Population surveys of countries generally use a sampling system. (Cipta et al., n.d.)

### **B. Demographic transition theory**

Demographic change or transition is a condition that describes changes in demographic parameters such as birth rates, death rates, and migration. (Harry & Harmadi, n.d.) Zelinsky (1971) stated that the fertility and mortality transitions are vitality transitions, and the demographic transition consists of vitality transitions and mobility transitions. (Harry & Harmadi, n.d.) In contrast to Zelinski, Notenstein (1945) emphasized that the only demographic change is the change in birth rates and death rates, which is natural change. (Harry & Harmadi, n.d.) The United Nations (1989) divides the demographic

transition into four stages:

1. In the first stage, the fertility rate is still very high, with the total fertility rate (TFR) indicator above 6, and the mortality rate is also high. (Harry & Harmadi, n.d.) On the other hand, life expectancy at birth is low, which is less than 45 years. (Harry & Harmadi, n.d.) The current population growth rate is very low. The number of births and deaths each year is too high to control. Various factors cause death, including war, crop failure and famine due to soaring food prices, and the spread of infectious diseases. (Harry & Harmadi, n.d.)

2. The second stage is marked by a rapid decline in mortality due to the discovery of antibiotics, the industrial revolution and technological advances. (Harry & Harmadi, n.d.) The birth rate shows a decline but at a very slow rate. The TFR at this stage is 4.5 to 6 and life expectancy at birth is 45 to 55 years. (Harry & Harmadi, n.d.)

3. The third stage is marked by a decline in the number of deaths, but the decline is starting to slow down. (Harry & Harmadi, n.d.) Life expectancy ranges from 55 to 65 years, but with the existence of family planning programs and the widespread use of contraceptives, the TFR has decreased drastically to the point where education levels have begun to increase. (Harry & Harmadi, n.d.)

4. The fourth stage is marked by low birth and death rates and low population growth rates. At this stage, the age or life expectancy is more than 65 years and the TFR is less than 3. (Harry & Harmadi, n.d.) The demographic transition process is assumed to be complete when the birth rate reaches NRR (net reproduction rate) = 1. This stage is usually experienced in developed countries. (Harry & Harmadi, n.d.)

According to Chesnais (1992), there are three types of life state transitions, namely type I which is found in the group of developed European countries. (Harry & Harmadi, n.d.) This type has two characteristics:

1. The natural growth rate should not exceed 2% per year. (Harry & Harmadi, n.d.)

2. The transition period lasts a very long time, between 75 and 200 years. (Harry & Harmadi, n.d.)

Natural population growth of 1,000 people is calculated only based on the difference between births and deaths of 1,000 people. The natural growth rate initially increases slowly, then peaks, and then decreases more slowly. Type I consists of three models, namely the first Nordic model, which is a country with a very long and important transition period for almost a century and a half. Sweden is included in this category. Second, the Western model which shows the highest natural growth achieved around 1900, and the transition occurred within a century, with Germany being one of the countries in this group. The third is the Southern model with a transition period of between 70 and 90 years. Italy is included in the model and has a natural growth rate of 1.25, achieved around 1900. (Harry & Harmadi, n.d.)

Type II includes the United States, Canada, and Australia. This country has the highest natural growth rate of 1.5%. This condition is influenced by young and old populations. Although the population structure is still young, there is not much change in natural increase, even population growth shows a downward trend. (Harry & Harmadi, n.d.)

Type III is similar to Type II, but the important transition process that occurs in has not been completed. This type includes developing countries, namely countries with very high growth rates (more than 3 percent per year), countries with high natural growth rates, namely between 2.5 and 3 percent, and countries with natural growth rates of around 2 percent to 2.5 percent. (Harry & Harmadi, n.d.)

David Lucas (1982) stated that the demographic transition occurs in five stages:



Stage 1, referred to as the high stationary stage, where the death rate and birth rate are very high, so that natural growth is very low or close to zero. This era was experienced by European countries in the 14th century. (Harry & Harmadi, n.d.)

Stage 2, referred to as the beginning of development where the death rate decreases very slowly as experienced by India during the Second World War. (Harry & Harmadi, n.d.)

Stage 3, or the final stage of development which shows a time when the death rate has decreased very quickly and faster than the decline in the birth rate, so that natural growth increases rapidly. This condition was experienced by Southern and Eastern Europe before World War II and India after World War II. (Harry & Harmadi, n.d.)

Stage 4, is the low stationary stage where the birth rate and death rate are both low, so that natural growth is also low. This condition was experienced by Australia, New Zealand, and the United States in the late 1939s. Stage 5, the declining stage where the birth rate has been low but the death rate is higher than the birth rate, so that natural growth is negative. (Harry & Harmadi, n.d.) This was experienced by France before World War II, East and West Germany in 1975. In addition, there are some weaknesses in this transition theory, because birth rates and death rates varied greatly in Western Europe at that time due to different types of marriages, and some countries were able to regulate birth rates. The process of decreasing death rates and births is not as simple as changes in vitality, especially if the causal factors are taken into account. In Europe, the decline in death rates was caused by improving social and economic conditions, while in developing countries the demographic transition process was driven by government intervention and the introduction of medicines and health equipment to regulate the number of deaths caused by the offer. (Harry & Harmadi, n.d.)

### **C. Pupulation Growth**

## 1. Definition of Population Growth

Population growth is a phenomenon that definitely occurs in a region or country and affects the population over time. (Fiska R, 2024) Changes in population over time affect the organization of a country. (Fiska R, 2024) Therefore, every country is required to monitor or pay attention to the growth of its territory. (Fiska R, 2024) If population growth is uncontrolled or unmonitored, population growth can disrupt the stability of the country, because the country is not ready to face this phenomenon. (Fiska R, 2024)

Population growth often involves changes in population over time, driven by several factors such as birth rates, death rates, and population migration rates. (Fiska R, 2024) In addition, population growth itself is classified into three types, namely natural population growth, non-natural population growth, and total population growth. (Fiska R, 2024) In the Big Indonesian Dictionary (KBBI), population growth is an increase or decrease in the population of a region. (Fiska R, 2024) Therefore, population growth in region A may be different from population growth in region B, so that development plans between regions A and B will also be different. Therefore, population growth that can vary due to birth rates, death rates, and population migration is one of the things that must be considered by each country so that its government system can function optimally. (Fiska R, 2024)

## 2. Population Growth Theory

### a. Adam Smith's Theory

Adam Smith's theory is estimated to have originated around the 18th century. (Fiska R, 2024) Adam Smith's theory was expressed together with the Physiocrats who rejected the birthism doctrine that existed in the era of mercantilism. (Fiska R, 2024) These thinkers assume that the population of a region is not a problem that affects the welfare of a society, but the land area factor is closely related to the level of production. Furthermore, Adam Smith

revealed that population growth and economic growth have a harmonious relationship. In other words, economic growth affects population growth. He added that population growth can be driven by the demand for labor. In addition, the demand for labor is also influenced by the productivity and function of the land. (Fiska R, 2024)

#### b. Neoclassical Theory

This neoclassical theory was expressed by neoclassical thinkers. (Fiska R, 2024) They argue that long-term economic growth undergoes a change called a steady state. (Fiska R, 2024) A steady state is an economic condition where there is no further growth and stagnation or static trends continue. (Fiska R, 2024) Some classical economic thinkers state that when the population increases sufficiently, it turns out that the population can change many times over in just one generation. In fact, as the population increases, the level of development can decrease. If the level of development decreases, workers' wages will be very low. (Fiska R, 2024)

### 3. Types of Population Growth

#### 1. Natural Population Growth

Natural population growth is the increase in the number of people that occurs because of or as a result of differences in birth and death rates that occur during a year. (Fiska R, 2024) To calculate natural population growth, it is usually expressed in units per thousand. Basically, we can observe natural population growth in the environment that we are familiar with, for example the RT or RW environment. (Fiska R, 2024)

#### 2. Unnatural Population Growth

The second type of population growth is unnatural population growth. (Fiska R, 2024) Unnatural population growth is the amount of population growth caused by the difference between the population receiving immigration (newcomers) and the population moving (immigrants). (Fiska R,

2024) Therefore, population growth is also called immigrant population growth. (Fiska R, 2024)

### 3. Total Population Growth

The third type of population growth is total population growth. (Fiska R, 2024) Total population growth is the increase obtained by calculating the difference between the number of births and deaths and adding it to the difference between the number of immigrants and emigrants. In other words, total population growth is the result of natural and non-natural population growth. (Fiska R, 2024)

### 4. Population Growth Factors

#### a. Birth (Fertility)

One of the causes of the increase in the population of a region is the number of births in the region. (Fiska R, 2024) The high or low fertility of a population group depends on the age structure, use of contraception, unemployment, education level, women's employment status, and economic development. (Fiska R, 2024) If the birth rate is higher than the death rate, then this birth factor can cause rapid population growth. Furthermore, if the birth rate is lower than the death rate, then population growth will be lower. (Fiska R, 2024) This birth factor can be said to have a major influence on the development of a country, especially in the fields of education and health. In terms of demographic change, the lower the birth rate of a country, the more likely the country is to be considered a developed country. (Fiska R, 2024) However, on the other hand, a decrease in the birth rate can cause problems of aging and abnormal situations that will affect the population structure of a country. There are two types of birth factors, factors that encourage birth and factors that inhibit birth. (Fiska R, 2024)

Birth Supporting Factors (Pro Natalitiy): Factors supporting the increase in the birth rate are usually caused by the large number of individuals who

marry at a young age. (Fiska R, 2024) Usually caused by the stigma of society and family where delaying marriage is not good and the assumption that many children bring good fortune, Children are the hope for parents as breadwinners, Children are the determinants of social status, Children are the successors of the lineage, especially boys. (Fiska R, 2024)

Factors Inhibiting Birth (Anti-Natality): Factors inhibiting birth rates are usually caused by the Family Planning program or commonly known as the KB program, Delaying the age of marriage on the grounds of completing education, the increasing number of career women. In addition, there is an age limit for marriage. (Fiska R, 2024)

#### b. Mortality

The next factor that can affect population growth is the mortality factor. (Fiska R, 2024) Generally, this cause of death is caused by the environment. For example, if the environment is healthy, clean, and not prone to disasters, the mortality rate will be lower. (Fiska R, 2024) However, if the environment is not clean and prone to disasters, the mortality rate can be high. (gramedia link) Another factor that affects demographics is the mortality rate. (Fiska R, 2024) When determining the mortality rate, there are two categories: crude mortality rate and age-specific mortality rate. (Fiska R, 2024) The crude mortality rate is the number of people who die per year per population in the middle of the year. (Fiska R, 2024) Mortality rates by age are influenced by several factors, including age, gender, and occupation. (Fiska R, 2024) The following factors support and inhibit the mortality rate in Indonesia:

Pro Mortality Supporters include: Low public awareness of the importance of health, Inadequate health facilities, Low nutritional status of the population and natural disasters such as volcanic eruptions, earthquakes, floods, wars, disease outbreaks, murder. (Fiska R, 2024) Inhibitors of Death (Anti Mortality) include: Increasing public awareness of the importance of health, adequate health facilities, improving the nutritional status of the population and increasing the number of medical personnel such as

doctors and midwives. (Fiska R, 2024)

c. Migration

The next factor that influences demographic trends is population migration. (Fiska R, 2024) Migration is part of population movement. (Fiska R, 2024) Population migration is the movement of people from one area to another. Population movements are either non-permanent (temporary), such as domestic and international tourism, or permanent (settled). Permanent population movements are called migration. (Fiska R, 2024) Therefore, migration refers to the movement of people from one place to another, across national or administrative boundaries, with the aim of settling. Population migration is the movement of people from one region (geography) to another region within a certain period of time. (Fiska R, 2024) In other words, population migration is the movement of a population from one geographical unit (region) to another geographical unit (region). (Fiska R, 2024) Population migration is an important study because it can reflect the activities of a country's people who play a role in the modernization process. (Fiska R, 2024) Types of Migration, broadly speaking, population movement can be divided into two, namely:

Vertical migration is the movement of people with the aim of changing social status. For example, a farm laborer changes jobs to become a trader, this is a sign of a change in social status. Likewise, the career transition from a dentist to a film actor involves vertical migration. (Fiska R, 2024)

Horizontal migration is any movement of people that crosses the boundaries of a certain area within a certain period of time. (Fiska R, 2024) The boundaries of the area (usually) are administrative boundaries such as states, districts, sub-districts, and villages. Horizontal migration is divided into two, namely: Permanent migration is the movement of a population from one area to another with the aim of settling in the destination area. Residential migration can be broadly divided into two types, namely: International migration is the movement of people from one country to another. (Fiska R,

2024) Demographic analysts pay great attention to international migration. This is not only because the data is more complete, but also often causes social tension. In the end, conflicts occur between people with different cultural and linguistic backgrounds. International migration is divided into three categories: Emigration is the movement of people from one country to another with the aim of settling (living) in the destination country. People who immigrate are called immigrants. (Fiska R, 2024) Immigration is the entry of people from one country from another country with the aim of settling (living) in the country visited. People who do this are called immigrants. Remigration (repatriation) is when someone returns to their place of origin (country of origin). (Fiska R, 2024) For example, Indonesians have lived in Singapore since 1990. In 2020, many people returned home and settled in Indonesia. Internal migration is the movement of people from one area to another within a country's territory. (Fiska R, 2024) Domestic (national) migration patterns are as follows: Transmigration is the movement of people from densely populated areas to less densely populated areas within a country's territory. Urbanization is the movement of people from villages to big cities or from small towns to big cities. (Fiska R, 2024) Ruralization, namely the movement of people from cities to villages and settling in villages. Ruralization usually occurs because employment opportunities in cities are very limited. Temporary migration is the movement of people from one area to another without the intention of settling in that area. Temporary migration is also called circulation. Factors causing circular population migration include centrifugal and centripetal factors. (Fiska R, 2024)

Centrifugal force is a force that covers an area and encourages the population that follows it to leave the area. Lack of job opportunities in the agricultural and non-agricultural sectors. Due to limited educational facilities, people are encouraged to go to areas that have more complete facilities. (Fiska R, 2024)

Centripetal force is a force that causes residents to remain in their area. The bonds of brotherhood and family between villagers are very close. There

is a strong mutual cooperation system in the village. Residents have a very close relationship with agricultural land. Villagers are attached to the village where they live. Improving transportation facilities connecting villages and cities will encourage circular mobility. (Fiska R, 2024) Previously, villagers who worked in the city were forced to live in the city, but after the roads were repaired and the number of public vehicles increased, they were replaced by commuters (going to the city in the morning and returning to the village in the evening). (Fiska R, 2024) Job opportunities in the informal sector are greater than in the formal sector. (Fiska R, 2024)

The urbanization process in Indonesia is not accompanied by the need for low-income and casual work. (Fiska R, 2024) The low income of migrants from villages who work in cities and the high cost of living in cities make it impossible for some of them. (Fiska R, 2024)

#### **D. Demographic bonus**

##### **a. Demographic Bonus**

In terms of age structure, the population can be divided into three main groups, namely the young age group (0-14 years, years), the working age group (15-64 years, years), and the old age group (64 years and above). (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Because the young and elderly groups are considered to have no productive capacity, excess population in both categories can hinder economic growth. On the other hand, the large number of working age population can encourage economic growth. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) The demographic bonus is the acceleration of economic growth as a result of a decrease in the death rate and fertility in a country and is a subsequent change in the age structure of a population. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) With a lower birth rate each year, the number of people under productive age will grow smaller when compared to the working age population. (Aji Setiawan



Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) With fewer elderly people, the country has a window of opportunity for rapid economic growth if social and economic policies can be formulated properly and investments are made in what is needed. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) The demographic bonus is a situation when there is a decrease in the dependency ratio caused by the demographic transition. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) The demographic bonus is the potential economic benefit obtained by a country because the proportion of the productive population is greater than the unproductive population. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Demographic bonus is defined as an economic benefit caused by the increasing amount of savings from the productive population, which can trigger investment and economic growth. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

#### b. Implications

Demographic changes have broad and significant implications in various aspects of life, including economic, social, educational, and political. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Here are some of the main implications of demographic changes. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

#### 1. Economic Implications

##### a. Economic Growth

Changes in demographic structure, such as decreasing birth rates and increasing life expectancy, can affect economic growth. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) A population dominated by productive age (15-64 years) can increase a country's productivity and economic competitiveness. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) In Indonesia, it is estimated that the demographic bonus will occur between 2020 and 2030, where around 70%

of the population will be under 40 years old. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

**b. Unemployment Rate**

If there is no good preparation, the increase in the number of productive age population can cause a spike in unemployment. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Without effective policies to create jobs, the potential demographic bonus can be a threat to economic stability. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

**c. Quality of Natural Resources**

To take maximum advantage of the demographic bonus, there needs to be investment in education and health. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Low quality human resources can hamper economic growth and lead to social instability. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

**2. Social implications.**

**a. Changes in consumption patterns**

With the increasing number of young people, consumption patterns and market demand will change. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) The younger generation tends to be more critical in choosing products and services, which requires adaptation from business actors to meet their needs. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

**b. social welfare**

The increasing number of elderly people also requires special attention in terms of health and social welfare policies. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) The government must prepare

health care and pension programs to meet the needs of the increasing elderly population. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

### 3. Educational implications

#### a. educational policy

Demographic changes affect the number of school-age children. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) If the number of children increases, the government needs to build more schools and improve the quality of education to meet these needs. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Conversely, if the number of children decreases, an evaluation of educational policies must be carried out;

#### b. Higher education

With the increasing interest of young people to continue their education to college, the government must expand the capacity of higher education institutions and offer financial support for better access to education. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

### 4. Political implications

#### a. Power dynamics

Changes in population composition can affect political dynamics and public policy. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Political parties may need to adjust their platforms to appeal to voters from new demographic groups. (Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

#### b. social conflict

Inequality in population distribution can trigger social conflict.(Aji

Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)  
Governments need to take steps to ensure social justice and prevent potential conflicts that may arise from demographic shifts.(Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018) Overall, demographic change offers great opportunities but also challenges that must be faced with a well-thought-out strategy so that its benefits can be maximized for the progress of society and the country.(Aji Setiawan Badan Pendidikan dan Pelatihan Keuangan & Keuangan, 2018)

## **V. Conclusion**

Population dynamics include changes in population due to births, deaths, and migration. There are three types of growth:

1. natural growth, calculated from the difference between births and deaths;
2. migration growth, based on immigration and emigration
3. total growth, which combines both. Birth and death rates are measured by the crude birth rate (CBR) and crude death rate (CDR). These dynamics affect social and economic development, and require attention in policy planning to address population challenges.

Population growth is influenced by variations in fertility, mortality, and migration. Increased population growth can be a burden on economic and infrastructure development, so it is important to have a family planning program to anticipate the explosion of population growth. The demographic bonus is a demographic phenomenon that arises from changes in the age structure of the population, especially the increase in the proportion of the productive age population (15-64 years). This can have a positive or negative impact depending on how the country optimizes the available human resources.

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