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# Demographic dividend, economic and employment growth in Indonesia

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## Abstract

The research aims to measure and analyze the relationship between growth and employment growth according to the economic sector in Indonesia, using secondary data for 2019-2023: variable economic growth and employment growth in Indonesia. Research data comes from the Central Statistics Agency of Indonesia. The descriptive quantitative analysis method uses the Coefficient of Employment Opportunity Elasticity with Elastic, Unitary, and Inelastic criteria. The study found that the employment opportunity coefficient for all economic sectors during the analysis period was inelastic, where the elasticity figure was less than one. The higher the elasticity of job opportunities, the greater the ability of the economic sector to create employment due to economic growth. The high elasticity of jobs means that the economic sector can absorb labor with the value-added sector and vice versa. Employment opportunity elasticity of less than one indicates the low ability of each economic sector to absorb labor in that sector. The demographic bonus era for each region is different; some districts or cities precede entering the demographic bonus era compared to the arrival of the bonus era at the provincial level. The bonus can come very slowly because a district with a large population has yet to enter the bonus era.

**Keywords:** Demographic dividend, Economic sectors, Employment elasticity, Indonesia.

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## 1. Introduction

Every country in the world places its hopes on demographic factors to support development Baerlocher et al. [1]. Saroj et al. [2] stated that human quality is essential for a country because countries with educated and skilled human capital, especially in mastering technology and science, are more likely to reach the level of developed countries than those with low levels of human capital. Barsukov [3] emphasized how the qualitative and quantitative aspects of demographic change can determine the extent to which a country's level of progress can be achieved, particularly in the socio-economic field. Gohmann

et al. [4] explained how a country's economic growth will increase if there is a positive correlation between job openings and workforce quality. This provides an overview of the relationship between demographic factors and the level of progress of a country, especially in the economic aspect.

Demographic factors in economic growth have been a current issue for a long time, one of which is the role of the demographic dividend in a country's economic progress. Ogawa et al. [5] explained how the abundance of competent and educated human resources drove Japan's rapid economic progress after the destruction of World War II. In contrast, Hu et al. [6] found that population aging significantly reduces the rate of economic growth. Population aging causes an increase in the share of the tertiary sector and a decrease in the share of the secondary industry. Because the per capita income obtained from the productivity of the secondary sector is much higher than that of the tertiary sector, this change in economic structure reduces the economic growth rate. The demographic dividend is a condition in which the composition of the productive age population (age range 15-65 years) is greater than the number of the non-productive age population Fadilah [7]. Mason and Kinugasa [8] explain that rapid growth in the working-age population can create a demographic bonus.

Previous literature has shown how the demographic bonus can bring many profitable economic and social potentials [9-12]. Specifically regarding its impact on economic growth, Wei and Hao [13] found that changes in the demographic structure affected economic progress in China from 1989 to 2004, where the decline in the dependency ratio increased GDP per capita, while the decrease in the total dependency ratio contributed to one-sixth of China's temporary growth. Eastwood and Lipton [14] analyzed the impact of the demographic transition on economic development in Sub-Saharan Africa from 1985 to 2025, showing that the dependency ratio provided a demographic dividend for Sub-Saharan Africa, which created a labor abundance in the region that could be utilized as an economic driver. Mason and Kinugasa [8] examined the demographic dividend in driving economic growth in East Asia from 1960 to 2000. They found that the demographic dividend was more prominent in East Asia because adequate income per consumer increased by 12.5%, while the impact of changes in adult survival and youth dependency caused an increase of about 20% in the savings rate.

Research on the relationship between demographic dividend and economic growth has been a strategic issue discussed for a long time by various population economists. The variation of this perspective comes from how to view the existing problem, such as some who see it from the population size, income, inequality, and national economic conditions to the population structure related to the birth rate, fertility, and mortality [15]. Meanwhile, according to Foster and Székely [16] there are three incomes in viewing the correlation between population growth and economic growth rates: income that states that it is restrictive, supportive, and neutral. Indonesia has experienced a demographic dividend phase since 2015, with the peak period estimated to occur in 2020-2035, when the birth rate decreases so that the percentage of the population aged 0-14 years and the dependency ratio decreases [17]. Therefore, this study attempts to answer the research gap, especially in determining the sensitive point of the relationship between economic growth and labor growth due to demographic dividends, especially in Indonesia. In addition, this study will provide significant benefits, especially for Indonesia, in seeking positive benefits from demographic dividends.

## 2. Literature Review

### *2.1. Demographic Bonus*

A demographic bonus is a condition where the composition of the productive age population (age range 15-65 years old) is greater than the non-productive age population [7]. A demographic bonus is a phenomenon that refers to the acceleration of economic growth that starts from a change in population structure caused by the transition of the population from high to low birth and death rates in a country [18]. The demographic bonus is also commonly called the demographic dividend in global terms. Demographic bonuses or dividends are advantages obtained from the demographic transition, where the demographic transition is a change from high to low mortality and birth rates. This change can increase economic growth due to the large number of individuals in the productive age group.

The demographic bonus occurs when the population structure has a large number of individuals in the productive age group (15-64 years) while the proportion of the young population is decreasing and the proportion of the elderly population is not significantly large. This situation brings a breath of fresh air, and Indonesia will reap economic benefits due to a decrease in the dependency ratio, which results from the reduction of infant mortality and declining fertility rates in the long term. However, this demographic bonus will only be realized if it is adequately prepared, for example, by improving the quality of human resources and creating jobs that align with the quality of these human resources. Therefore, interpreting the demographic bonus as a form of new middle-class growth is a tangible manifestation of a genuine window of opportunity for spurring economic growth. There are three essential theses to understand the correlation between population growth and rising economic growth: restrict, support, and neutral [19].

### *2.2. Economic Growth*

Economic growth is defined as an increase in Gross Domestic Product, regardless of whether the increase is more significant or smaller than the population growth or whether or not changes in the economic structure occur. Regional economic growth will directly or indirectly create jobs [20]. Okun, who introduced Okun's Law, stated that a close relationship exists between the unemployment rate and gross domestic product (GDP). In contrast, a negative relationship exists between the unemployment rate and real GDP [21]. This statement can be interpreted to mean that there is a positive relationship between job opportunities and real GDP. The growth theory states that, definitively, the growth rate of output (Y) minus the growth rate of labor productivity (Y/L) is more or less equal to the growth of employment opportunities (L).

*2.3. Employment*

Employment is jobs and work opportunities created for an economic activity [22]. Thus, employment refers to several people who are employed or have a job. Employment is a person who has the opportunity to work and a person who is in a job. So, the meaning of employment in English is clear: the opportunity occupied. On a macro level, employment growth can be linked to economic growth. In other words, economic growth will affect the growth of employment. The relationship between economic growth and employment growth can be explained through employment elasticity [23]. Employment elasticity is a measure that shows economic growth's sensitivity to employment growth.

Thus, employment elasticity compares employment growth with the growth of each economic sector Endri et al. [24]. Keane [25] shows that four factors determine employment elasticity: a) the elasticity of labor supply to real wages; b) the elasticity of the marginal product of labor; c) the elasticity of the marginal product of capital; and d) the elasticity of output to capital. Research conducted by Bryden and Bollman [26] found that growth in the service sector in cities, the agricultural industry, and the industrial sector in rural areas significantly increased employment. The growth of the agriculture, industry, and service sectors in urban areas also significantly influences employment growth in urban areas. This means that economic growth in urban areas has attracted workers from rural areas to migrate.

On the contrary, economic growth in rural areas has a positive effect on the growth of rural employment opportunities. However, it is not significant for the development of urban employment opportunities. Verma and Mishra [27] found that during the COVID-19 pandemic, unemployment reached its highest level since the severe depression that hit India. This situation poses a real threat to the worsening of poverty and inequality.

The measurement analysis of the sensitivity of the relationship between economic growth and employment opportunities is calculated from the elasticity of employment opportunities. Kwiatkowski and Włodarczyk [28] define employment elasticity as the relationship between an increase in employment and an increase in production expressed in a comparison. Employment elasticity can be used to determine how sensitive employment is to economic growth. With this approach, employment is assessed now and in the future [29]. Analysis using the concept of elasticity will determine the relationship between economic growth and job opportunity growth with the following criteria [30].

## 3. Research Methods

This type of research is descriptive, aiming to describe things currently in effect. Efforts are being made to describe, record, analyze, and interpret the conditions that are now occurring or not occurring using Indonesian data for the 2019-2023 period. Data analysis uses secondary data sourced from related institutions/agencies. The relationship between economic growth and employment growth is analyzed using the Employment Elasticity analysis tool**:**

$$Є = \{ ( \Delta N / N) : ( \Delta Y / Y ) \} \times 100\ \%$$

Information

Є: Employment elasticity as a whole in the economic sector

N: Sector i workforce

ΔN: Manpower changes in sector i

Y: the added value of sector i in GDP (Gross domestic product)

ΔY: changes in sector i added in GDP (Gross domestic product)

ΔY/Y: economic growth rate (GDP).

This elasticity indicator is often used to analyze the nature of capital-intensive or carry-intensive businesses.

$$Li = \left[\sqrt[n]{\frac{Ln}{Lo}}\right] - 1\ x\ 100\%$$

$$Qi = \left[\sqrt[n]{\frac{Qn}{Qo}}\right] - 1\ x 100\%$$

Information:

Ln = number of employment in the nth year

Lo = number of employment in the base year

Qn = Total GDP for the nth year

Qo = Number of gross domestic Poduk in the base year

n = number of base years period.

The elasticity coefficient of employment is used to measure the size of employment opportunities due to changes in economic growth. An analysis of the elasticity coefficient of employment is used with the following formula:

$$Ni = \frac{Li}{Qi}$$

Information:

Ni = Employment elasticity sector i

Li = Employment growth in sector i

Qi = Economic growth in sector i

Criteria for the relationship between economic growth rate and employment:

Ni > 1 ( *elastis* ): An increase in economic growth of 1% will cause employment growth of more than 1%.

Ni = 1 (*unitary*): An increase in economic growth of 1% will cause employment growth of 1%.

N i < 1 (*inelastic*): Economic growth of 1% will cause employment growth below 1%.

## 4. Results and Discussion

*4.1. Indonesia's Economic Growth in the Era on the Peak of the Demographic Bonus*

**I**ndonesia's economy grew 5.02 percent in 2019, lower than the 5.17 percent achieved in 2018. In terms of production, the Other Service Business Field achieved the highest growth at 10.55 percent. 2020 experienced a growth contraction of 2.07 percent compared to 2019. Indonesia's economic growth in 2024 is projected to reach 5.0%. Factors supporting this growth are strong domestic consumption and government spending.

Nonetheless, high inflation and rising interest rates remain challenges. In addition, regional economic growth is also expected to remain solid. Based on Gross Domestic Product at effective prices, Indonesia's economy reached Rp 5,288.3 trillion in the first quarter of 2024. Indonesia's economy grew by 5.11 percent in production in the first quarter of 2024 compared to the first quarter of 2023. The economic sectors of government administration, defense, and compulsory social security experienced the highest growth, at 18.88 percent.

Meanwhile, in terms of expenditure, the consumption expenditure component of non-profit institutions serving households experienced the highest growth of 24.29 percent. Indonesia's economy in the first quarter of 2024, compared to the previous quarter, contracted by 0.83 percent in terms of production. The deepest growth contraction occurred in the economic sector of the Education Services Business by 10.34 percent, meanwhile, in expenditure. The component of government consumption expenditure experienced the deepest growth contraction of 36.69 percent. During the first quarter of 2024, the provinces on the island of Java still showed their spatial influence in the Indonesian economy by recording a role of 57.70 percent despite experiencing a slowdown in growth of 4.84 percent compared to the first quarter of 2023.

Indonesia's economy in the first quarter of 2024, compared to the first quarter of 2023, grew by 5.11 percent. Growth occurred in all economic sectors except Agriculture, Forestry, and Fisheries, which contracted by 3.54 percent. The financial industries that grew significantly were Government Administration, Defense, and Compulsory Social Security by 18.88 percent, Health Services and Social Activities by 11.64 percent, and Corporate Services by 9.63 percent. Meanwhile, the Processing and Wholesale Trade Industry and retail repair of Cars and Motorcycles, which have a dominant role, grew by 4.13 percent and 4.58 percent, respectively. The structure of Indonesia's Gross Domestic Product by business sector in the first quarter of 2024 remained the same. The Processing Industry still dominates Indonesia's economy at 19.28 percent, followed by Wholesale Trade and retail car and Motorcycle Repair at 13.15 percent; Agriculture, Forestry, and Fisheries at 11.61 percent; Construction at 10.23 percent and Mining and Quarrying at 9.34 percent. The role of these five business fields in the Indonesian economy reached 63.61 percent. Compared to Quarter 4-2023, Indonesia's economy in Quarter 1-2024 contracted by 0.83%, following the seasonal pattern of previous years.

The demographic bonus must be optimized as much as possible for economic growth through modern human resource investment. This explosion of the working-age population will provide financial benefits if it meets the following requirements: 1) A large labor supply increases per capita income if productive job opportunities exist. 2) The role of women, namely the small number of children, allows women to enter the job market and helps increase income. 3) The existence of community savings that are invested productively. 4) Quality human capital if there is an investment for it. Wei and Hao [13] stated that a population structure that has a highly productive age has the potential to increase economic growth rapidly.

Historically, signs of the emergence of the demographic bonus phenomenon in Indonesia began in the early 1990s through the success of the Family Planning program (KB). This family planning program is based on the logic of developmentalism, assuming that when the population experiences overload, it will have symmetrical implications for poverty. This differs from the concept of family planning carried out in developed countries, which is more oriented towards controlling fertility rates. Family planning policies in developing countries are directed at economic calculations aimed at advancing agrarian societies that are still underdeveloped. The demographic bonus era is a period of the explosion of the productive age population that can support the unproductive population; it usually lasts 20-30 years, and fertility is decreasing and low. The number of people under the age of 15 years is relatively low. The number of people over 60-65 years is low.

In the last decade, Indonesia has experienced a demographic transition phenomenon, as indicated by the results of the 2000 population census (SP). Based on the 2000 Population Census (conducted every ten years), significant facts about the Family Planning program have had a positive impact. The 2000 Population Census shows that the population under the age of 15 barely increased from about 60 million in the 1970s-1980s, and by the end of 2000, the number was only about 63-65 million. In contrast, the population aged 15–64 years in 1970 amounted to about 63–65 million and had grown to about 133–135 million by the end of 2000. Alternatively, it has doubled in 30 years. The burden of dependency, measured by the ratio of the population of children and older adults to the working-age population (15-64 years), has decreased sharply from about 85-90 per 100 in 1970 to about 54-55 per 100 in 2000.

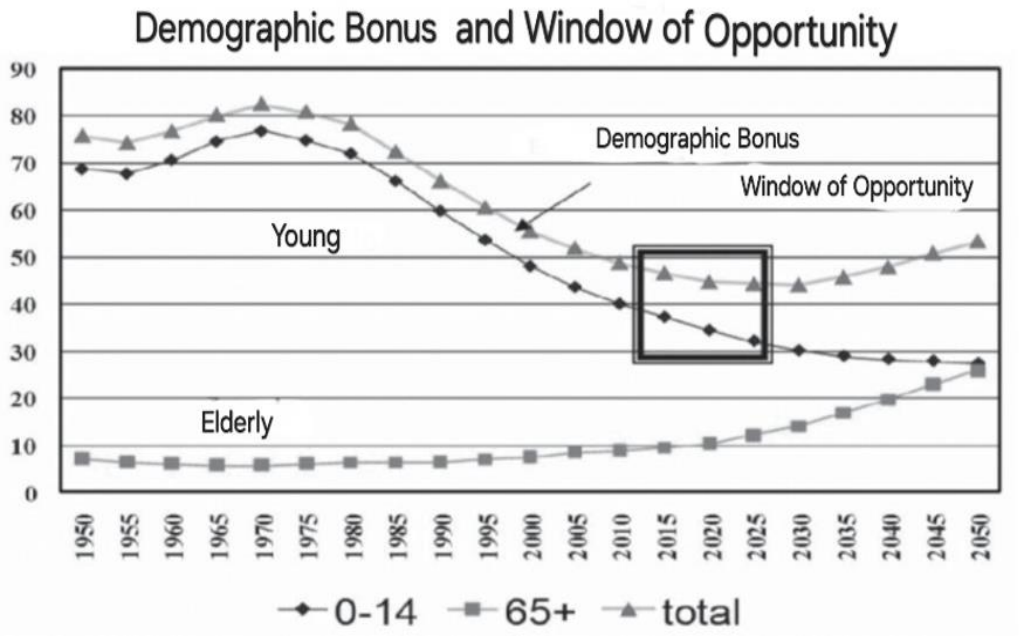


**Figure 1**.
Demographic bonus and window of opportunity.

There are various perspectives on the relationship between population growth and economic growth. Some of them consider the size of the population, income inequality, and the condition of the national economy, along with the natality, fertility, and mortality rates [15]. The productive age population and the number of workers are increasing. If the population works more and has fewer dependents, it will increase national savings. The proper management of human resources encourages greater participation in the labor force. Thus, there is an increase in demand and market absorption of domestic production. If demographic bonuses/dividends are not included in the workforce, then the dividends do not bring benefits. Projecting 2030-2035, when the dependency ratio for Indonesia is ideal at 46.9, all provinces in Java will have entered the demographic bonus era. Other central provinces have also entered, except for North Sumatra province. Until 2035, the provinces of North Sumatra, West Sumatra, Central Java, East Nusa Tenggara, Southeast Sulawesi, West Sulawesi, Maluku, and North Maluku will remain outside this era. Many districts or cities enter the demographic bonus era before the arrival of the bonus era at the provincial level. It is also possible that the bonus comes very slowly because a district with a large population has yet to enter the demographic bonus era. The demographic bonus must be optimized as much as possible for economic growth through modern human resource investment.

*4.2. Indonesia's Employment Situation*

There was an absorption of 3.55 million people from February 2023 to February 2024.

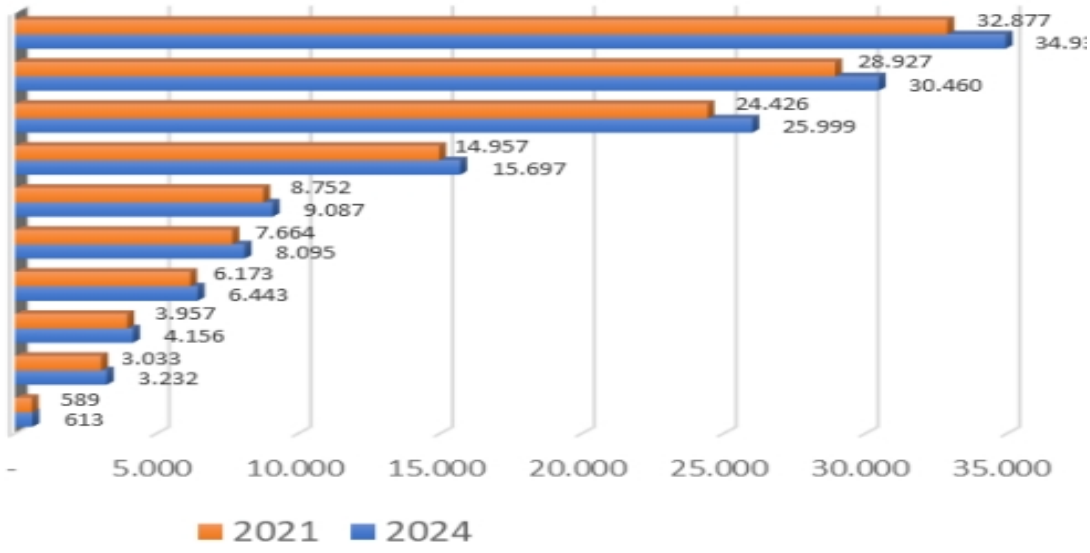


**Figure 2.**
Estimated Labor Needs by Type of Job/Position, Indonesia 2021 and 2024 (Thousand People).

Employment spread by various types of jobs can be grouped into ten categories and is expected to continue to increase during 2021-2024. During this period, the highest increase was in the type of employment, service workers, and sales personnel, which reached 2.1 million people or 686.7 thousand per year, from 32.9 million people in 2021 to 34.9 million people in 2024. In addition, employment opportunities are expected to increase to reach 1.5 million people during this period, including skilled workers in agriculture, forestry, fisheries, and manual labor. Unfortunately, these two types of jobs are not included as high positions. Job opportunities for two high positions, namely professional and managerial positions, are expected to increase in professional positions compared to managers. The increase in employment opportunities for skilled positions is 431.4 thousand people or 143.8 thousand people per year, from 7.6 million in 2021 to 8.1 million people in 2024. Employment for manager positions increased by 199.5 thousand people or 66.5 thousand people per year, from 3.03 million people in 2021 to 3.23 million people in 2024.

The Elasticity Coefficient can be used to determine how sensitive employment is to economic growth, as indicated by gross domestic product. Data analysis on the financial activities of the population focuses on the allocation of the Labor Force according to the economic sector. The division of the working population and its development over time by economic sector is often analyzed by differentiating into three main economic sectors, namely: the Agriculture sector (sector A), the Industry sector consisting of sectors no. 2-6, and the Service Sector consisting of sectors no. 7-17.

**Table 1.**
The Elasticity of Job Opportunities in Indonesia's Main Economic Sectors.

| | **Employment Elasticity** | | | | |
|---|---|---|---|---|---|
| **Major Economic Sectors** | 2019 | 2020 | 2021 | 2022 | 2023 |
| Agricultural Sector | 0.06 | 0.06 | 0.06 | 0.01 | 0.06 |
| Manufacturing Sector | 0.13 | 0.04 | 0.05 | -0.04 | 0.03 |
| Service Sector | 0.14 | 0.07 | 0.08 | -0.01 | 0.38 |

The Agriculture, Forestry, and Fisheries sector includes all businesses obtained from nature and are biological (living) objects or goods whose results can be used to meet their living needs or sold to other parties. This includes activities that primarily aim to meet one's needs (subsistence). The results of the employment elasticity calculation showed a number below one, which means that employment growth in this sector was lower than economic growth, with the category of inelastic during the five-year analysis period. The Manufacturing sector includes Mining and Quarrying, the Processing Industry, Electricity and Gas Procurement, Water Procurement, Waste Management, and Recycling. Construction is inelastic. The Service sector includes wholesale and retail trade, car and motorcycle repair, transportation and warehousing, accommodation and food and beverage provision, information and communication, financial and insurance services, real estate, corporate services, government administration, defense, and compulsory social security, educational services, health services and social activities, and other services, which are inelastic. The agricultural sector still holds the most significant portion in providing jobs for the Indonesian people.

However, the agricultural sector has yet to be able to provide elastic job opportunities in recent years. Since 2019-2023, the number of workers who can accommodate the farm sector has decreased. Several factors cause the low employment growth rate in the agricultural industry. The decreasing land area and uncertain weather have resulted in a decline in agricultural production growth; in general, the farming sector is more familial, and the farm industry also uses more technology, which is work-based, so the productivity produced by the agricultural sector tends to be low. Meanwhile, other fields, such as industry, manufacturing, and services, have experienced positive growth. The results of the research and analysis show that the relationship between economic growth and employment growth for all economic sectors is inelastic, which means that employment growth is lower than economic growth. In 2020, almost all economic sectors experienced a decline in employment growth. Undeniably, this is the result of the Covid-19 pandemic outbreak that hit. The Covid-19 pandemic has caused the unemployment rate in Indonesia to increase. Few workers were forced to accept the Termination of Employment policy from the company in 2020.

The increase in the number of open unemployment is much more significant than the poverty rate; the poverty rate in 2020 saw an increase of 1.13 million or 0.41%, while open unemployment increased by 3 million or 2.2%. This shows that during the pandemic, the poverty level can still be reduced, partly due to the many social assistance programs. However, overcoming unemployment is not that easy. This unemployment is challenging to address. Statistically, creating jobs quickly is essential to counter the impact of unemployment. As a result of the demographic bonus, young people must learn to build positive partnerships. Relations between countries aim to create job opportunities for large bonuses towards sustainable development.

Some districts or cities precede entering the demographic bonus era compared to the arrival of the bonus era at the provincial level. The bonus came very slowly because a district with a large population had yet to enter the bonus era. Therefore, every province, district, and city must be vigilant and prepare population management carefully and earnestly. Labor-intensive development can stimulate an area to enter the demographic bonus because much labor is absorbed by development. On the other hand, regions that are slow to absorb young workers will lose the opportunity to enter the era of demographic bonuses. An area that can be built based on human resources will have the chance to enter the era of demographic bonuses positively. Some industrial areas enter the demographic bonus era first because of the labor migration process absorbed by the industry. Some regions will enter the bonus era in 2040 or even 2050 because the areas have failed

in family planning and health programs, and development could be more conducive, so many adult residents move to other places. Therefore, each province must be vigilant to get potential human resources to explore its region's wealth optimally.

## 5. Conclusions

Employment growth is lower than economic growth, as indicated by the value of employment elasticity being less than one in all economic sectors. The sensitivity of the relationship between economic growth and employment growth in the era toward the peak of the demographic bonus is inelastic. Economic growth during the analysis period has yet to adequately absorb the workforce. The higher the employment elasticity indicates, the greater the economic sector's ability to create jobs due to economic growth. High employment elasticity means the economic sector can absorb the workforce with the value-added sector and vice versa. Employment opportunity elasticity of less than one indicates the low ability of each economic sector to absorb labor. The demographic bonus era for each region is different; some districts or cities precede entering the demographic bonus era compared to the arrival of the bonus era at the provincial level. The bonus can come very slowly because a district with a large population has yet to enter the bonus era. Therefore, every province, district, and city must be vigilant and prepare population management carefully and earnestly. Labor-intensive development can stimulate an area to enter the demographic bonus because much labor is absorbed by development. On the other hand, regions that are slow to absorb young workers will lose the opportunity to enter the era of demographic bonuses.

Economic growth will create employment. Growth must continue to be increased by exploring existing economic potential to open up new job opportunities. Especially with technological innovations, many significant changes have occurred in the production system, the distribution of goods, and even in terms of services. Technology is the primary key to today's economic growth and development. To deal with it, we must improve our abilities or learn new skills to survive in the world of work. Although it replaces many human jobs, technology paves the way for creating jobs. Moreover, the current trend in Indonesia is up-and-coming, namely e-commerce. Thanks to this, the online job market provides more space in the business world for small to medium entrepreneurs.

From a macroeconomic point of view, the elasticity indicator is often used to analyze the nature of capital-intensive or labor-intensive businesses; therefore, the government must consider prioritizing investment (new job creation) for sectors with high coefficient values, which play a dominant role in creating a conducive investment climate (safe and secure legal certainty of doing business). Technology should be applied to create new jobs by considering the harmony between labor-intensive technology (human) and capital-intensive technology (machine). Each province must be vigilant in obtaining potential human resources to explore their region's wealth optimally. An area that can be built based on human resources will have the opportunity to enter the era of demographic bonuses positively. Some industrial areas enter the demographic bonus era first because of the labor migration process absorbed by the industry. Some areas will enter the bonus era in 2040 or even 2050 because the area failed in the Family Planning program, and health, poverty, and development could have been more conducive, leading to many adult residents moving to other places.

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