THE EFFECT OF AGING POPULATION, FERTILITY RATES, AND POPULATION GROWTH ON ECONOMIC GROWTH IN INDONESIA

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ABSTRACT

The declining fertility rate in Indonesia, coupled with an increasing aging population and continuous population growth, has become a national concern, leading to potential alterations in Indonesia's economic landscape. This research delves into the ramifications of Indonesia's aging population, fertility rates, and population growth on its economic growth, employing a comprehensive analysis of time series data from 1961 to 2022. Utilizing multiple linear regression, this investigation aims to unveil the interconnectedness between demographic variables and economic advancement. This study found that the aging population has no statistically significant influence on economic growth. However, fertility rates demonstrate a notable negative impact on economic growth, while population growth showcases a significant positive influence on economic growth. These findings underscore the necessity for targeted policy interventions aimed at addressing demographic shifts to ensure sustainable economic development in Indonesia.

Keywords: Aging Population, Population Growth, Fertility Rate, Economic Growth

INTRODUCTION

As the current population of elderly persons grows in nearly every nation, including Indonesia, they now represent a larger proportion of the overall population. Combined with the declining fertility rate in Indonesia, the increase in life expectancy, and global population growth, these dynamic changes are expected to have widespread effects across various sectors of society. Based on the 2023 Elderly Population Statistics, the proportion of the elderly population (aged 60 and above) has reached 10.82% in 2021, and increased to 11.75% in 2022 (BPS, 2023).

The dynamic shift in age structure originates from the demographic transition, marked by three distinct phases: a decline in fertility followed by a decrease in mortality. These phases progress from a high dependency ratio of the young population to a higher proportion of the working-age population, and finally to a high dependency ratio of the elderly population. The second phase, characterized by an increased proportion of the working-age population, is believed to positively influence economic growth. In contrast, the phases with higher dependency ratios among the young and elderly negatively impact the economy. Bloom et al. (2003) refer to the economic growth from a rising working-age population as the demographic dividend, while Mason (1997) calls it the population bonus. Conversely, the economic burden from a shrinking working-age population and increasing youth and elderly dependency ratios is often termed the population onus.

As the current population continues to grow, along with prolonged life expectancy and ongoing decreases in fertility rates, global concerns about aging populations are increasing. As the

population ages, more individuals begin retirement. However, the sluggish replacement rate due to declining fertility is anticipated to hinder economic growth. As the costs associated with health and retirement programs for the elderly continue to rise, it will impose a greater financial strain on individuals during their working years, who will be required to contribute more to support the elderly. Furthermore, this increase in expenses will put pressure on public budgets. Ultimately, an aging population may lead to constrained labor efficiency, diminished engagement within the workforce, and hindered economic growth.

However, the phenomenon of population aging is not ubiquitous globally, nor is it consistently observed within individual countries. According to the World Bank (2022), the population of elderly persons in Indonesia has been increasing, and projections indicate a continues to rise. This trend contrasts with relatively modest increases in the elderly persons population in countries across Western Asia, Northern Africa, and Sub-Saharan Africa. In addition to the aging population, fertility decisions also have implications for the decline in fertility rates concerning economic development. According to the United Nations (2019), Indonesia exhibits a Total Fertility Rate (TFR) of 2.2, which is slightly above the replacement threshold of 2.1 children per woman. Conversely, third-world countries such as Congo, Angola, and Nigeria demonstrate significantly higher birth rates per woman, at 4.4, 5.4, and 6.8, respectively (United Nations, 2019).

Despite extensive research in previous literature, the correlation between the aging population, fertility rate, population growth, and economic growth remains uncertain, as a combination of both positive and negative findings being recorded. In a recent investigation, Ye et al. (2021) posit that the rise in the population aged 65 and above in China has led to a decline in GDP per capita growth due to a reduced labor force ratio and productivity growth. Studies conducted by Mohd et al. (2021) concludes that the aging population exerts a substantial long-term influence on economic growth in Malaysia. Temsurit (2023) successfully investigated how an increase in the aging population affects economic growth in Thailand, particularly through higher government spending. Meanwhile, in Europe, the anticipated surge in the proportion of the population aged 65 and above, from 18.2% to 30% by 2050, has prompted widespread concerns regarding the adverse economic ramifications of this demographic shift (Marois et al., 2020).

The phenomenon of population aging and deceleration in population growth has additionally been associated with a decline in productivity growth, alterations in the transmission mechanism of monetary policy toward consumption (Wong, 2019), also decreasing dynamism in the labor market (Hopenhayn et al., 2022). The influence of the aging population and population decline on economic growth has been extensively discussed in several research studies. Population aging can stimulate automation as a means to compensate for a diminishing labor force, thereby leading to increased productivity over the long term (Acemoglu & Restrepo, 2017). On the other hand, adopting a global viewpoint argues that a decreasing global population will ultimately result in fewer innovations, potentially leading to a gradual regression in living standards (Jones, 2022).

The literature that explores the macroeconomic implications of fertility choices has consistently highlighted the advantageous outcomes associated with a decrease in fertility rates for economic advancement. These benefits include alleviating pressure on finite resources and facilitating accelerated development of human capital through the quantity-quality trade-off. Currently, scholarly focus has been directed towards a novel concern, specifically, the ramifications stemming from ultra-low fertility rates and population decline toward economic growth. Previous population projections operated under the assumption that fertility rates would eventually stabilize at approximately two children per woman globally. However, evidence from recent decades indicates the potential persistence of low fertility rates, which could lead to declining populations over time (Doepke et al., 2023). Indeed, regions characterized by prolonged sub-replacement fertility rates, such as Japan, are currently witnessing population declines (Goh et al., 2020). In some cases, these declines can be notably severe. For instance, South Korea recorded a total fertility rate of merely 0.92 in 2019, implying a scenario where each subsequent generation is projected to be less than half the size of the preceding one should this trend continue (Han & Lee, 2020). The declining global fertility rate remains a cause of concern for policymakers due to

the anticipated modification of countries' demographic patterns. Osiobe (2019) explained that an increase in the nation's fertility rate will lead to a fall in GPD per capita. According to Salvati (2020), who investigated fertility patterns in Italy over different geographical regions and periods using a multi-scale spatial approach, it was found that there is a connection between fertility trends and economic downturns. Countries with higher average levels of female education, greater GDP per capita, increased accessibility to contraceptives, and more comprehensive family planning programs tend to exhibit lower total fertility (Götmark & Andersson, 2020).

Population growth can be detrimental to long-term economic prosperity. Economists highlight various negative effects such as decreased savings, higher dependency ratios, strain on healthcare and education systems, and limited food supply. This perspective traces back to Malthus's first essay on population in 1978, wherein he initially highlighted the detrimental impact of population expansion on economic progress. Subsequent research, exemplified by Degu's (2019) study in Ethiopia corroborates this negative correlation between population growth and economic advancement. Similarly, Azam (2022) identified an inverse relationship between population growth and economic growth. However, contrasting viewpoints exist, with some scholars like Kremer (1993) suggesting that population growth can foster economic growth through increased innovation (more folks, more ideas). Azam et al. (2020) supported this notion in their study in India, showing a positive influence of population growth on economic advancement. Akinola (2021) also discovered a positive correlation between economic growth, population growth, food production index, and human development index, further accentuating the intricate nature of the relationship between population growth and economic prosperity.

However, due to the diverse characteristics of each nation, their responses to demographic changes would differ in terms of economic growth. Foreseeing these demographic shifts according to each country's circumstances allows them to proactively devise policies to adapt to an aging population, fertility decisions, and population control. This proactive approach is vital for promoting inclusivity and resilience amid an uncertain future. Therefore, existing studies tend to overlook variations in Indonesia, focusing mainly on developed, developing, and third-country group-level analyses. This creates a gap in understanding how aging populations, fertility rates, and population growth affect economic growth in Indonesia. Although research on the demographic factors' relationship with economic growth exists, there is limited empirical evidence specific to Indonesia. Thus, conducting analyses in Indonesia is necessary to comprehensively grasp the dynamics between demographic changes and economic growth. Furthermore, the influence of demographic factors on economic growth may vary across countries due to disparities in infrastructure, resources, and governance, highlighting the need for research on the nuanced relationships within Indonesia. Addressing these gaps can provide valuable insights into the localized impacts of demographic transitions, guiding tailored policy interventions for sustainable and inclusive growth. Having said so, this study aims to examine the impact of the aging population, fertility rates, and population growth on economic growth in Indonesia. By analyzing these impacts, it fills knowledge gaps regarding the diverse demographic dynamics in Indonesia. The findings are expected to provide valuable insights for policymakers in enhancing the Indonesian policies on Population, Family Development, and Family Planning (Bangga Kencana) programs, as well as in designing more effective and inclusive economic development strategies. This research aims to guide efforts toward sustainable economic growth nationwide by informing targeted interventions and policies that address the challenges and opportunities posed by the aging population, fertility rates, and population growth in Indonesia.

METHOD

In this study, a quantitative research methodology has been employed to scrutinize the influence of the aging population, fertility rates, and population growth on economic development in Indonesia. The investigation primarily relies on secondary data obtained from The World Bank spanning the years 1961 to 2022 (62 years). For analyzing the aging population, data on the

population aged 65 and above (% of the total population) were utilized; fertility rates were assessed using data on total fertility rates (births per woman); to assess population growth, the researcher employed data on population growth (annual %); while economic growth was measured using GDP per capita growth (annual %).

Table 1 Variables and Indicators Used

Variable	Indicators	Source
Aging Population (AP)	The population aged 65 and above (% of the total population)	World Bank (2023c)
Fertility Rates (FR)	Total fertility rates (birth per woman)	World Bank (2023a)
Population Growth (PG)	Population growth (annual %)	World Bank (2023d)
Economic Growth (EG)	GDP growth per capita (annual %)	World Bank (2023b)

Source: The World Bank (2023a), (2023b), (2023c), (2023d)

This study used multiple linear regression to assess the influence of each factor, there for several statistical tests carried out in this study encompassed classic assumption tests (normality, multicollinearity, and heteroscedasticity test), coefficient determination analysis (Adjusted R Square), and hypothesis testing (t-test). The regression model can be served as follows:

$$EG_i = \beta_0 + \beta_1 AP + \beta_2 FR + \beta_3 PG$$

Note: *EG* (Economic Growth); *AP* (Aging Population); *FR* (Fertility Rates); *PG* (Population Growth); *β0* (Constant Value; and *β1, β2, β3* (Regression Coefficient).

Aging population (AP) is expected to negatively affect economic growth (EG), as a higher percentage of the elderly population is anticipated to slow down productivity due to a decrease in the active labor force participation rate. Meanwhile, the fertility rate (FR) is expected to be negatively associated with economic growth (EG), since a higher rate of female labor force participation, increased urbanization, and higher per capita income are linked to a lower fertility rate. Furthermore, population growth (PG) is expected to stimulate economic growth (EG), as a larger population will increase the labor supply, also consumption expenditure. However, it should be noted that the impact of population growth can be either positive or negative, depending on the conditions of the countries

Hypotheses:

H1 : Aging population has a negative effect on economic growth

H2 : Fertility rate has a negative effect on economic growth

H3 : Population growth has a positive effect on economic growth

RESULTS

The significance of the connection between demographic factors and economic growth in Indonesia is notably high, as it deepens the understanding of the challenges and issues that hinder the progress of this country's development. The findings of this study underscore the intricate relationship between population growth, the aging population, fertility rates, and economic growth in the country. Firstly, this part describes the data for each indicator from 1961-2022. The results of the descriptive analysis in this study were presented in Figure 1 and Table 2, providing insights into the central tendency, variability, and distribution of the variables under examination.

Figure 1 Trend Lines of Variables
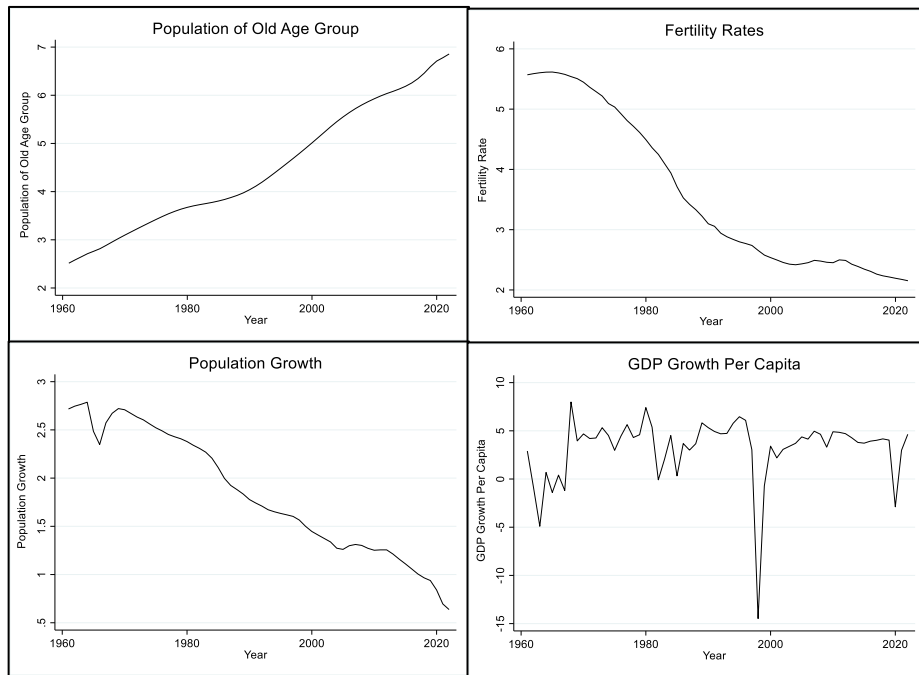
Source: Processed by the researcher (2024)

Table 2 Descriptive Statistics

Variables	Mean	Std. Deviation	Minimum	Maximum
Aging Population	4,64592	1,248092	2,515	6,857
Fertility Rates	3,41990	1,212141	2,153	5,614
Population Growth	1,75986	0,616994	0,637	2,787
Economic Growth	4,10363	1,190546	0,406	6,466

Source: Processed by the researcher (2024)

Figure 1 and Table 2 represent the percentage of the population aged 65 and above, total fertility rate, percentage of population growth, and GDP Per Capita Growth in Indonesia over 51 years from 1961 to 2022 (excluding 11 years as outliers). Based on Table 2, approximately 4.65% of the total population comprised elderly individuals, with this proportion fluctuating between 2.52% and 6.86%. The mean total fertility rate (TFR) across the years was approximately 3.42 births per woman during their reproductive years. During the analyzed period, Indonesia experienced an average population growth rate of approximately 1,76%, ranging from 0,64% to 2,79%. A higher population growth rate indicates a faster rate of increase in the population size. Furthermore, the average economic growth rate was approximately 4,10%, indicating that Indonesia underwent economic expansion during the analyzed period. The lowest rate, recorded in 1966, was 0.406%, while the highest, observed in 1995, reached 6,466%.

Before commencing the regression analysis, the researcher undertook classical assumption tests including tests for normality, multicollinearity, and heteroskedasticity. The findings of the normality test are depicted in Figure 1, while the results of the multicollinearity test are presented in Table 4. Additionally, the outcomes of the heteroskedasticity test are illustrated in Figure 2.

Figure 2 Histogram and Normal P-Plot of Regression Standardized Residual
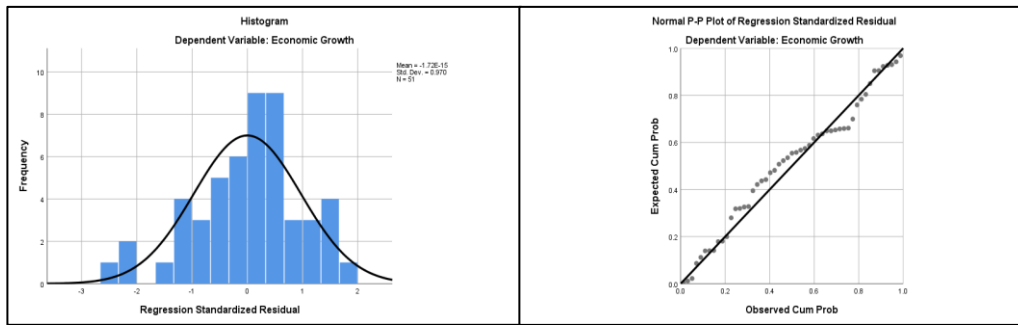
Source: Processed by the researcher (2024)

As illustrated in Figure 2, the histogram presents a well-balanced distribution pattern, followed by the Normal Probability-Probability (P-P) Plot of Regression Standardized Residual graph, where data points exhibit dispersion around the diagonal line, closely adhering to it. Consequently, it can be inferred that both graphical representations indicate the adequacy of the regression model for utilization, as they satisfy the assumption of normality. To confirm the normality test result, this study employs One-Sample Kolmogorov Smirnov. It is observed that the asymptotic significance (two-tailed) value stands at 0.200, surpassing the conventional threshold of 0.05, which means that the data were normally distributed.

Table 3 Multicollinearity Test Result

Variables	Collinearity Statistics	
	Tolerance	VIF
Aging Population	0,580	7,328
Fertility Rates	0,610	6,317
Population Growth	0,220	4,913

Source: Processed by the researcher (2024)

The second classical assumption test performed is the assessment for multicollinearity. As indicated in Table 3, it is evident that all variables demonstrate tolerance values exceeding 0.10, with Variance Inflation Factor (VIF) values for each variable falling below 10. Hence, it can be deduced that there is no evidence of multicollinearity among the independent variables within the regression model.

Figure 3 Heteroscedasticity Test Result
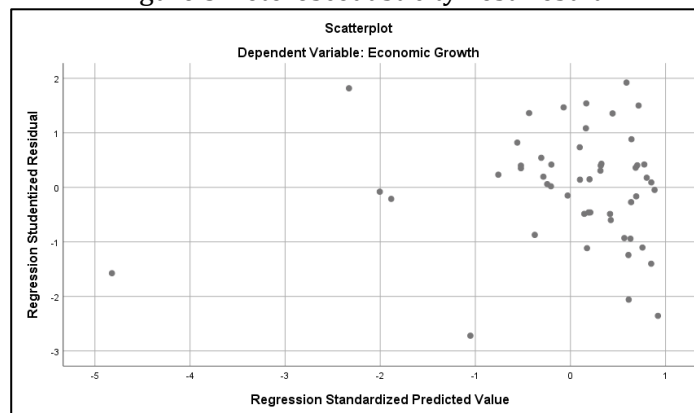
Source: Processed by the researcher (2024)

Subsequently, the researcher also conducted a heteroskedasticity test to ascertain the presence of unequal variance in residuals across observations within the regression model. According to Figure 3, it can be concluded that there is no evidence of heteroskedasticity in the regression

model, thereby affirming its suitability for predictive purposes. In summary, the data in this study meet all classical assumptions.

To evaluate the impact of each independent variable, this study employs multiple linear regression analysis. The data processing through the SPSS software produced the following output (see: Table 4):

Table 4 Coefficient Table

Variables	Unstandardized Coefficients		t-value	p-value	Conclusion
	B	Std. Error			
(Constant)	2,607				
Aging Population	0,889	0,521	1,706	0,095	H1 Rejected
Fertility Rates	-1,760	0,521	-3,206	0,002	H2 Accepted
Population Growth	4,711	1,689	2,774	0,008	H3 Accepted

Source: Processed by the researcher (2024)

Based on Table 5, the multiple linear regression model in this study can be formulated as follows:

$$EG = 2,067 + 0,889AP - 1,760FR + 4,711PG$$

The findings from the multiple linear regression analysis indicate a constant value of 2,067. This suggests that when the variables of aging population, fertility rates, and population growth are all at zero, economic growth level stands at 2,067. Additionally, the regression coefficient values for aging population, fertility rates, and population growth are 0.889, -1,760, and 4,711 respectively. These coefficients indicate that each if population growth and aging population increase by 1-point, economic growth will increase by 4,711 and 0,889 respectively. In contrast, if the fertility rates decrease 1 point, the economic growth will increase 1,760.

Based on the results or t-statistic test (see: Table 5), it was determined that the variable of aging population attained a p-value of 0,095>0,05 and t-value of 1,706, it can be inferred that aging population does not affect economic growth in Indonesia (H1 rejected). However, the variable of fertility rates obtained a p-value of 0,002<0,05, with a corresponding t-value of -3,206, it can be inferred that fertility rates significantly and negatively affect economic growth in Indonesia (H2 accepted. Furthermore, it was determined that for the variable of population growth, the significance test yield a p-value 0,008 < 0,005, with a corresponding t-value of 2,774, it can be inferred that population growth significantly and positively affect economic growth in Indonesia (H3 accepted). Moreover, the analysis of the coefficient of determination reveals an Adjusted R Square value of 0,138, indicates that 13,8% of the variability in economic growth can be accounted for by the variables of population growth, aging population, and fertility rates, while the remaining 86,2% is attributed to other variables beyond the variables of the study.

DISCUSSION

The Effects of Aging Population on Economic Growth in Indonesia

According to the research findings, there has been a consistent upward trend, indicating a gradual aging of the population from 1961 to 2022. In 1961, only 2.515% of the population fell into this age group, while by 2022, it had risen to 6.857%. On average, around 4.65% of Indonesia's population was aged above 65 during the analyzed period. The steady rise in the proportion of elderly individuals reflects demographic shifts, such as declining fertility rates. This aging population poses challenges for the country's development. It was observed that a 1% increase in the population of the elderly age group (aged 65 years and above) corresponded to a 0.889 increase in economic growth. However, the findings from hypothesis testing indicated that the p-

value of 0.095 > 0.05, and the t-value of 1.706 < the critical t-table value. These results suggest that there is no statistically significant influence of the aging population on economic growth in Indonesia during the specified period. Consequently, the First hypothesis is rejected.

The observed initial correlation between an increasing elderly population and economic growth in Indonesia raises intriguing questions regarding the underlying mechanisms at play. Although the positive relationship of this variables related to potential benefits such as increased consumer spending and a larger pool of experienced workers, it's essential to recognize that the impact of aging population dynamics on economic growth can vary widely across different contexts. In some countries such as China, Malaysia, Thailand, and Europe for instance, the increasing number of elderly individuals coincide with declining economic growth rates (Marois et al., 2020; Mohd et al., 2021; Temsumrit, 2023; Ye et al., 2021). This discrepancy underscores the nuanced nature of the relationship between demographic shifts and economic development. Several factors could contribute to this complexity. One possibility is the strain that an aging population may place on social welfare systems and healthcare infrastructure, leading to increased public expenditure and potentially crowding out investments in other areas critical for economic growth. Additionally, a shrinking workforce due to aging demographics could result in labor shortages and reduced productivity, thereby hampering overall economic output. Furthermore, changes in consumption patterns among elderly populations, characterized by a shift towards goods and services with lower economic multipliers, may dampen the stimulative effects on economic growth.

However, these findings support several previous studies, such as the findings of Lee & Shin (2019) which discovered that the aging population has a negative impact on economic growth solely upon reaching a certain elevated threshold. Chen et al (2016) stated that the increasingly serious aging population cannot be directly linked to economic growth. Conversely, the economic decline doesn't occur due to aging population as long as older workers maintain good health (Cylus & Al Tayara, 2021). Furthermore, Temsumrit (2023) found that the negative effect of aging population on economic growth only in developed countries. Additionally, Pham & Vo (2021) indicated a positive correlation between the proportion of individuals aged 65 and older and long-term economic performance.

The Effects of Fertility Rates on Economic Growth in Indonesia

Based on the research findings, from 1961 to 2022, the highest TFR recorded was 5.614 in 1962, while the lowest was 2.153 in 2022. This data exhibits a significant downward trend over the years, indicating a decline in fertility rates in Indonesia Across the analyzed period. In addition, the mean TFR is calculated at 3.419. The declining fertility rates hold implications for population growth, demographic structure, and socio-economic development, including considerations for healthcare, education, and labor market dynamics in Indonesia. Through regression analysis, it was determined that the regression coefficient stands at -1.760, indicating a negative relationship between the Total Fertility Rate (TFR) and economic growth. Specifically, for every one-unit increase in TFR, economic growth is estimated to decrease by 1.760 points. Furthermore, it was observed that this variable exerts a positive and statistically significant impact on economic growth in Indonesia.

This finding underscores the significant impact of TFR on economic growth in Indonesia. The negative relationship between TFR and economic growth showed that higher fertility rates correspond to lower levels of economic growth. This aligns with economic theory, as increased fertility rates may lead to greater resource allocation towards child-rearing expenses, thereby reducing investment in productive economic activities (Doepke et al., 2023). Higher fertility rates can exert pressure on social services and infrastructure, potentially straining government budgets and hindering long-term economic development efforts (H.-J. Chen et al., 2024). Moreover, elevated fertility rates may contribute to a larger labor force in the short term, but if not accompanied by adequate job creation and skill development opportunities, this demographic expansion could lead to underemployment and inefficiencies in the economy. Thus, the negative

impact of increasing TFR on economic growth underscores the importance of policies aimed at promoting family planning, improving education and healthcare access, and fostering sustainable economic growth pathways in Indonesia.

The findings of this study align with the research conducted by Chen (2024), which revealed a negative correlation between fertility rates and economic growth in China (S. Chen, 2024). In many rich countries, it was evident that the fertility rate had declined (Miles, 2023). Furthermore, Lee (2012) highlight the fertility rate combined with other factors that determine the economic growth rate in the EU for 15%, and 10% in East Asian Countries. The slowdown of economic growth is mostly experienced by countries with higher fertility rates, due to higher inequality (Shen & Zhao, 2023).

The Effects of Population Growth on Economic Growth in Indonesia

According to the findings of this study, the annual population growth rates in Indonesia from 1961 to 2022 illustrate significant variability. The lowest recorded population growth rate was 0.637 in 2022, while the highest reached 2.787 in 1964, with a mean population growth rate of 1.759 over the analyzed period. This fluctuation can be attributed to various factors, including shifts in fertility rates, mortality rates, migration patterns, governmental policies, and socioeconomic conditions. Through multiple regression analysis, it was ascertained that a 1% increase in population growth corresponds to an economic growth increase of 4.711 units, representing the most substantial contribution among the examined variables. This outcome underscores the positive correlation between population growth and economic expansion. Additionally, statistical analyses revealed a significant and favorable impact of population growth on economic growth, emphasizing the pivotal role of demographic factors in propelling economic growth.

The study findings underscore the substantial influence of population growth on economic growth within Indonesia. This correlation emphasizes the pivotal role of demographic factors in fostering economic expansion. With population growth, there is a corresponding expansion in the labor force, potentially resulting in heightened productivity and economic output (Azam et al., 2020). Additionally, a growing population can stimulate demand for goods and services, driving business growth and investment (Akinola, 2021). Moreover, population growth can also attract foreign investment, as a larger market size may present more opportunities for profitability. Furthermore, a youthful population demographic can contribute to innovation and entrepreneurship, fostering dynamic economic growth.

The present study aligns with numerous prior research findings demonstrating a positive association between population growth and economic growth. Yunker (2024) through his study found that population growth contributes as a significant determinant of economic growth in both China and India. Furthermore, Bucci et al. (2019) also documented the unequivocally positive impact of population growth on economic growth.

Limitations

While this study offers valuable insights, it is essential to acknowledge several limitations. Primarily, the research concentrates solely on the direct impacts of demographic factors on economic growth, omitting the exploration of potential mediating or moderating variables. Future research could explore these relationships in more depth, considering additional factors such as technological advancements, institutional quality, and international trade. This study also lacks a detailed examination of provincial trends, potentially leading to overlooking variations in demographic impacts across provinces in Indonesia. Future research could focus on provincial-level analyses to better understand regional disparities and tailor policy interventions accordingly, ensuring more targeted efforts towards inclusive economic development.

Furthermore, longitudinal studies could yield valuable insights into the enduring effects of demographic shifts on economic growth in Indonesia.

CONCLUSION

This study shed light on the intricate relationship between demographic factors and economic development in Indonesia. This study revealed significant insights into the effects of aging population, fertility rates, and population growth on the nation's economic trajectory. Despite an initial correlation between a growing elderly population and economic advancement was observed, statistical analysis suggests that the influence of an aging population on economic development in Indonesia lacks statistical significance. Furthermore, declining fertility rates were found to negatively impact economic growth, highlighting the importance of policies aimed at promoting family planning and sustainable economic growth pathways. Conversely, population growth was positively associated with economic expansion, emphasizing the role of demographic factors in driving economic development.

These findings prompt the proposal of several policy recommendations aimed at tackling demographic challenges and fostering economic development in Indonesia. Primarily, targeted policies are warranted to address the repercussions of an aging population, encompassing investments in healthcare, bolstering social welfare systems, and implementing initiatives to encourage active aging and workforce engagement among the elderly. Moreover, initiatives aimed at advancing family planning and enhancing accessibility to education and healthcare services can aid in alleviating the adverse effects of declining fertility rates on economic growth. Moreover, policies aimed at harnessing the potential benefits of population growth, such as investments in infrastructure, education, and skills development, can further stimulate economic growth and development in Indonesia.

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