



# ANALYSIS OF FOOD SECURITY ON ECONOMIC GROWTH IN INDONESIA

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**Abstract:** This study aims to determine the relationship between three factors that affect economic growth in Indonesia. The determinants of food security are food security index, government revenue for health services and population. The food security index was chosen as the first variable in this study, because the food security index is a measuring tool in describing food availability in Indonesia. Meanwhile, the variable of government income for health services was chosen because it is thought to have a close relationship with food distribution. And the last independent variable is the population variable or the number of people per region which was chosen because this variable is thought to contribute to the value of the increase in economic growth in Indonesia. This study uses secondary data from several major websites, so it is concluded that only the Food Security Index variable and the Population variable have a positive effect on economic growth and have a significant effect

**Keyword:** Economic Growth, Food Security Index, Health Services, Population

## I. INTRODUCTION

Food is the most important basic human need and its fulfillment is part of human rights guaranteed in the 1945 Constitution of the Republic of Indonesia as a basic component to realize quality human resources. According to the Food Security Council, food security will be realized if it meets two conditions, namely the availability of sufficient and equitable food needs for the population of an area and the population has physical access and economic access to food needs in order to meet nutritional adequacy to lead a healthy and productive life within a certain period of time. The achievement of a food security condition will never be achieved if the insecurity in the farming community cannot be resolved properly (Agaptus, 2019).

Adequacy of food production, distribution and consumption for Indonesia is an important issue for food security, which has interrelated dimensions with social, economic and political fields. Various food security subsystems are integrated into a food security system which includes food availability accompanied by food affordability and no less important is also accompanied by food quality and safety. The synergy of the three subsystems above creates food security (Center for Agricultural Data and Information Systems, 2022). Abraham Maslow initiated a hierarchy of basic human physiological needs that must be met before other needs are met, namely food (Sumarwan, 1997 in Mega Silvia, 2023).

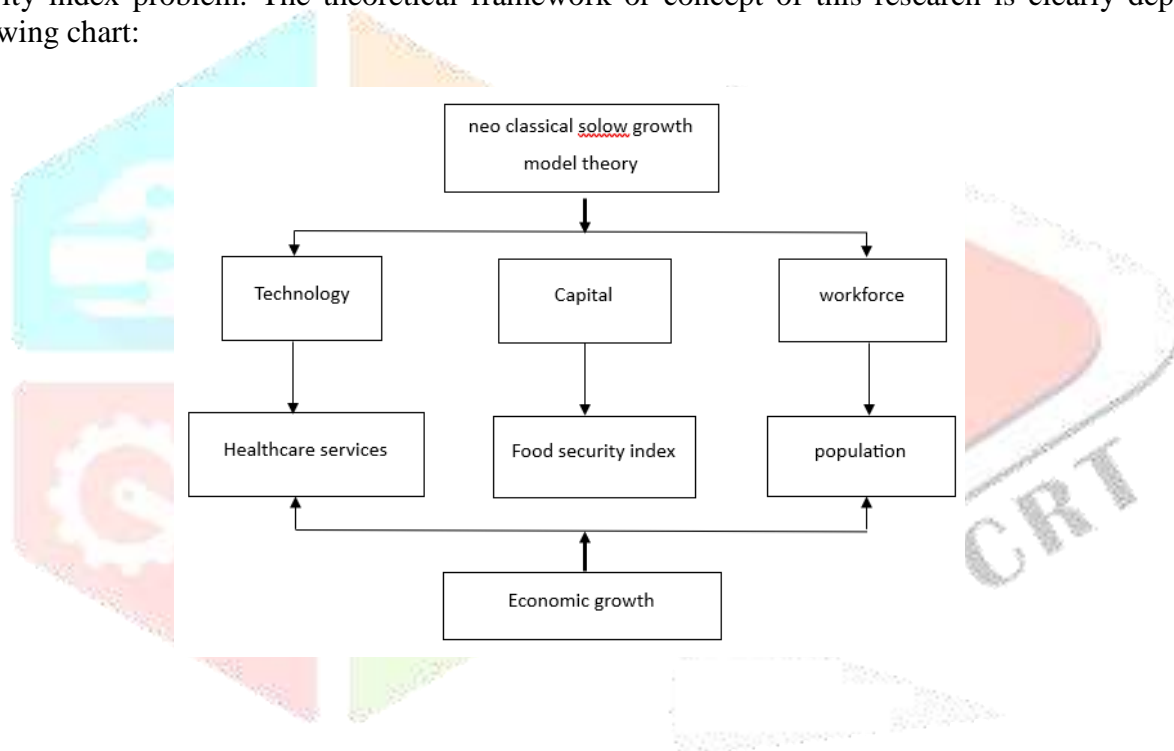
Research from the Food and Agriculture Organization (2021) reports that from 2018 to 2020 there was a global increase in hunger sufferers. In 2020, a total of 768 million people suffered from hunger or about 9.91 percent of the world's human population. The hunger level in Indonesia is ranked third in Southeast Asia after Laos and Timor Leste according to the Global Hunger Index (2021). The score of 18 points for Indonesia's hunger level is still above the global average of 17.9 points, which means that Indonesia's food security is still low. According to Economist Intelligence (2021), it is noted that the Global Food Security Index (GFSI) score

shows that the index for Indonesia's food security is at a score of 59.2 from a range of 0-100. Of the 113 countries in the world evaluated, Indonesia is in 69th position (Mega Silvia, 2023).

As a basis for achieving sustainable economic growth, there are significant benefits of food security in addition to its benefits for human health. (Abolghasem Pourreza, 2018). The sustainability of economic growth is highly dependent on achieving food security. Without a food security strategy, countries will bear most of the costs of maintaining food security by increasing domestic production and minimizing dependence on food imports. Heavy reliance on imported food will lead to food security problems with high levels of chronic malnutrition, limited food for human resource development, poverty problems, reduced labor productivity, reduced life expectancy income and lower economic growth (Nur Marina, 2019).

## II. LITERATURE REVIEW

The Food Security Index (FSI) is a composite value of indicators used to capture the status of food security in a region. IKP is calculated based on indicators representing three aspects of food security, namely availability, affordability and quality and food security. The national IKP has a very strategic role in evaluating the achievements of food security and nutrition in districts/cities and provinces, as well as providing a ranking of food security achievements in districts/cities and provinces compared to other districts/cities and provinces. Furthermore, IKP is expected to be used as a basis when conducting program interventions so that they are more focused and targeted. There is one grand theory that supports and becomes the basis for solving the food security index problem. The theoretical framework or concept of this research is clearly depicted in the following chart:



## III. METHODOLOGY

In general, the econometric model built is representative enough to describe the indicators that affect the food security index in 34 provinces in Indonesia. This research uses quantitative methods, all data used are secondary data, namely data from the Food Agency, the Central Bureau of Statistics and data from the National Development Planning Agency which are then analyzed using multiple linear regression models with the Eviews version 9 application.

### Panel Data Regression Analysis Method

The data analysis method used to test the effect of food security index, health services, and population on economic growth partially in this study is panel data regression analysis. This panel data regression analysis is used by testing the independent variable with the dependent variable where there are 34 provinces and within a certain period of time. The formulation of panel data regression analysis systematically is as follows (Basuki and Prawoto (2017: 275).

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

**Description:**

Y = Economic Growth

 $\alpha$  = Constant coefficient $\beta_1$  = Food Security Index regression coefficient

X1 = Food Security Index (IKP)

 $\beta_2$  = Health Services regression coefficient

X2 = Health Services

 $\beta_3$  = Population regression coefficient

X3 = Total Population

 $\epsilon$  = Error rate**Classical Assumption Test**

## a. Normality Test

This test needs to be done because all parametric statistical calculations have the assumption of normality of distribution with the Normality requirement: If the probability value  $< 0.05$ , then the data is not normally distributed. If the probability value  $> 0.05$ , then the data is normally distributed.

## b. Autocorrelation Test

The autocorrelation test aims to show the correlation of members of observations sorted by time or space (Ajija, 2011).

## c. Multicollinearity Test

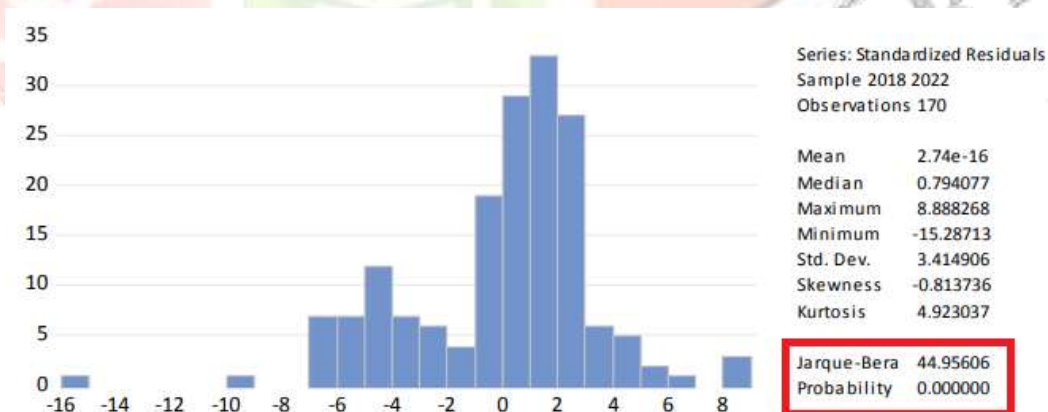
The multicollinearity test assesses whether there is a correlation or intercorrelation between independent variables in the regression model (Anwar, 2017).

## d. Heteroscedasticity Test

Heteroscedasticity is one of the factors that cause simple linear regression models to be inefficient and inaccurate, also resulting in the use of the maximum likelihood method in estimating regression parameters (coefficients) will be disrupted (Anita Rahayu, 2021).

**IV. RESULT AND DISCUSSION****4.1 Results of Classical Assumption Test**

## a. Normality Test



Source: Eviews Version 9, 2024

From the results above, it can be described and explained that the distribution of data in 34 provinces in Indonesia is uneven, because the first is that the population (population) in each province is far different from other provinces, in other words, the difference in population is quite striking, the second is that the data on the economic growth rate in 2022 in many provinces is minus, meaning that there is a lack of availability of health services in these provinces, the third is that health services in some provinces are quite striking with numbers too high compared to other regions or provinces. There are eight provinces where the number of health services is quite high compared to other provinces, namely DI Yogyakarta, Jambi, Riau Islands, Lampung, Maluku, Riau, North Sulawesi and West Sulawesi. The three points above can cause the calculation of the health service data distribution rate to be uneven or in other words not normally distributed.



## b. Autocorrelation Test

## Cross-section fixed (dummy variables)

R-squared	0.357197	Mean dependent var	3.812647
Adjusted R-squared	0.183205	S.D. dependent var	4.259314
S.E. of regression	3.849429	Akaike info criterion	5.723572
Sum squared resid	1970.808	Schwarz criterion	6.406069
Log likelihood	-449.5036	Hannan-Quinn criter.	6.000521
F-statistic	2.052949	Durbin-Watson stat	2.484634
Prob(F-statistic)	0.001736		

there is  
caused,

o it means that  
ocorrelation is  
becomes non-

stationary, meaning that the data does not move towards the average. The autocorrelation test can only be performed on time series data, while this research is panel data that combines time series data with cross section data. This causes the autocorrelation test results to be biased and not as desired. Autocorrelation testing here is only to fulfill the classic assumption test and prove that specifically for this test it is not suitable with panel data.

## c. Multicollinearity Test

	X1	LOG(X2)	LOG(X3)
X1	1.000000	0.128637	0.334214
LOG(X2)	0.128637	1.000000	0.176289
LOG(X3)	0.334214	0.176289	1.000000

Source: Eviews Version 9, 2024

The multicollinearity test results above show that there is no high correlation value between independent variables because it does not exceed 0.90 (Ghozali, 2013: 83). The correlation coefficient on the independent variables  $< 0.90$ , so there is no multicollinearity problem (Passed Multicollinearity Test). The understanding that can be given here is that all independent variables, namely the food security index variable with the health services variable and with the population variable (population), have met the requirements in the regression model, meaning that there is no correlation or relationship between these independent variables. A good regression model is a regression model that does not occur multicollinearity. A regression model in which multicollinearity occurs will result in the estimation interval tending to be larger, making the independent variable statistically insignificant even though the coefficient of determination ( $R^2$ ) value is high, making it difficult to get the right estimate.

## d. Heteroscedasticity Test

Heteroskedasticity Test: White			
Null hypothesis: Homoskedasticity			
F-statistic	0.914002	Prob. F(9,160)	0.5146
Obs*R-squared	8.312759	Prob. Chi-Square(9)	0.5030
Scaled explained SS	17.90764	Prob. Chi-Square(9)	0.0363

Source: Eviews Version 9, 2024

The results above show that the Prob value  $> 0.05$  (0.5030), so there is no problem in the heteroscedasticity test or in other words it passes the heteroscedasticity test. The heteroscedasticity test above is used to determine whether or not there is a deviation from the classical assumption of heteroscedasticity, namely the existence of an inequality of variance from the residuals for all observations in the regression model. Heteroscedasticity is one of the factors that cause simple linear regression models to be inefficient and inaccurate, also resulting in the use of the maximum likelihood method in estimating regression parameters (coefficients) will be disrupted.

## 4.2 Descriptive of Study Variables

### a. The Effect of Food Security Index on Economic Growth

Departing from the theory of the Solow Neo-classical Growth Model which is a function of technology, capital and labor and based on the results of previous journal research Nur Marina Abdul Manap 2019 in "Food Security And Economic Growth" states that food security has an impact on economic growth, especially in developing countries that are dryland countries. The study identified that food security has a significant positive impact on food security, increasing food security will increase economic growth in drylands in 117 developing countries. Indonesia is included in 117 developing countries proving that food security has an impact on economic growth, due to the total area of dry land in Indonesia which is around 144.47 million ha, meaning that the area of dry land is a factor of the food security index in influencing economic growth. So that the food security index has a significant effect on economic growth.

The Effect of Government Revenue by Business Field in the Health Services Sector on Economic Growth

One of the health service variables that significantly affects economic growth is health expenditure (health services) in the journal: Serge Mandiefe Piabuo and Julius Chupezi Tieguhong, 2017 "Health expenditure and economic growth - a review of the literature and an analysis between the economic community for central African states (CEMAC) and selected African countries" does not apply to the range of 2018 to 2022 in Indonesia, meaning that these results indicate that the income of the Indonesian government in the field of health services does not have a significant effect on economic growth, because the health conditions of the Indonesian population in that year range are not too bad, unlike the situation in Africa. On the African continent there is a lack of investment in health and measures to address it. Environmental and social determinants of health are serious barriers to improving health outcomes in Africa, given that the continent registers the majority of maternal and infant deaths globally that is the same as registering the largest number of people with HIV/AIDS. So with the state of health on the African continent, the variable health services in Africa greatly affects or is significant to the level of economic growth.

### b. The Effect of Government Revenue by Business Field in the Health Services Sector on Economic Growth

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### c. Effect of Population on Economic Growth

The results of the analysis for 34 provinces in Indonesia from 2018 to 2022 from all the tests above show positive, which means that the results of the analysis in this research show that population has a significant effect on economic growth in Indonesia. Although according to BPS the population growth rate or population in Indonesia from 2018 to 2022 has decreased, namely in 2018 the population growth rate was 1.33 percent and in 2022 it was 1.77 percent. However, the population increase per province in terms of total population has increased from 2018 to 2022, although in each province the increase is not the same. So if it is related to the influence of economic growth, it is very influential with the value of the economic growth rate in Indonesia. Likewise, the annual population growth rate in Pakistan fluctuates up and down, but for Pakistan's population increase from year to year is almost approximately 50 million people per 10 years. Thus, the increase in population affects economic growth for Pakistan.

## V. CONCLUSION

1. That partially the variable X2 (health services) has a negative effect and does not have a significant effect on economic growth in 34 provinces in Indonesia with a real level of 5%, but simultaneously (together) with variables X1 (food security index) and X3 (total population) have a value that has a significant effect on economic growth (Y). For the health services variable, although in previous journals it was proven to have an effect on economic growth, especially for African countries, it is not the same for Indonesia because of the different health levels in each country. Indonesia specifically for the health services variable is not significant to its economic growth, there is a significant effect on economic growth (Y).
2. That partially the variables X1 (food security index) and X3 (population size) have a positive effect and have a significant effect on economic growth in 34 provinces in Indonesia with a real level of 5%, namely with a t-test value of 3.037106. Hypothesis testing can be said to be significant when the T-statistics value is greater than 1.96, whereas if the T-statistics value is less than 1.96 it is considered insignificant (Ghozali, 2016). This means that an increase in the food security index and population based on previous journals is also proven for Indonesia to affect economic growth. Previous journals state that food security has an impact on economic growth, especially in developing countries that are dry land countries, and Indonesia is one of the developing countries where most of the land is dry land.
3. Based on the Classical Assumption test, it is known that the normality test and autocorrelation test are not passed, while the autocorrelation and heteroscedasticity tests are passed. The food security index (X1) and health services (X2) are free from the classical assumption test. But for variable X3 (total population) there is a high correlation value between independent variables that exceeds 0.90 (Ghozali, 2013: 83), namely variable X3 has a correlation value of 0.334214 so it is concluded that there is multicollinearity between independent variables.

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