



## THE EFFECT OF POPULATION DEPENDENCY, TECHNOLOGY, AND EDUCATION ON HUMAN DEVELOPMENT IN INDONESIA DURING THE PANDEMIC COVID-19

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### Abstract

This study aims to determine the effect of population dependence, technology, and education on human development. Human development in this research is measured by adjusted per capita expenditure. The research method used in this study is from panel data from 2019 – 2021 in 34 provinces in Indonesia with a descriptive quantitative model. Based on the partial analysis, the population dependency technology variable has a positive and significant effect on human development by the probability value of smaller than alpha (0.05). At the same time, the education variable has a negative and significant effect on human development in Indonesia during the covid-19 period. Simultaneously, all variables significantly affect human development, shown through R<sup>2</sup> of 99.80% and 0.20% and are explained by other variables outside the study.

**Keywords:** Adjusted Per Capita Expenditure, Population Dependency, Technology, Education

### INTRODUCTION

The issue of human resource development is still homework for the Indonesian people. The level of human resource development can be seen through the Human Development Index (HDI). HDI is a composite index formed from three dimensions, one of which is a decent standard of living represented by adjusted per capita expenditure. Adjusted per capita expenditure can describe people's purchasing power in consuming goods and services (Prayogo & Sukim, 2021). In 2019, during uncertain economic conditions, all components that makeup GDP from the expenditure side grew slower. One of them is household consumption which grew by 4.97% compared to the previous year (Bappenas, 2020). Slowing household consumption has a direct effect on adjusted per capita expenditure. So that in 2019 the adjusted per capita expenditure grew by 2.17%. The situation is exacerbated by entering the beginning of 2020, with the Covid-19 disaster causing adjusted per capita spending to contract.

The decline in economic activity, which resulted in a decrease in employment and an increase in the Open Unemployment Rate (TPT), was seen based on data on the working population of 128.45 million people. This figure decreased by 0.31 million compared to the previous year, reaching 128.76 million people. The TPT figure increased by 1.84 per cent compared to the previous year, which was 5.23 per cent. Household Consumption Expenditure (PK-RT) decreased, which resulted in a decrease in actual per capita expenditure (Central Bureau of Statistics, 2020) that did not meet the dimensions of a decent standard of living. Based on a survey conducted by LIPI, were laid off as many as 30.9% of workers in Indonesia. This figure was more significant than the percentage of layoffs predicted by the ILO of 10.5% (Ngadi et al., 2020).

In addition, 31% of workers experienced a decrease in income of less than 50%, and 8.6% of other workers claimed to have experienced a decrease in income of more than 50%. The highest adjusted per capita expenditure decline occurred in the Province of East Kalimantan. The decline in adjusted per capita expenditure was inseparable from the decline in people's purchasing power due to the decrease in the average wage of 6.81 per cent. In Papua Province, it can be seen from the decrease in household consumption expenditure by 5.48%. The same happened in the provinces of North Kalimantan, Riau, North Maluku, North Sulawesi, DI Yogyakarta, North Sumatra, and South Sumatra; the decline in per capita expenditure was caused by the decline in people's purchasing power. Another 6% of workers claimed to have experienced a more than 50% decrease in income. The highest decline in adjusted per capita expenditure occurred in the Province of East Kalimantan; the decline in adjusted per capita expenditure was inseparable from the decline in people's purchasing power due to the decrease in the average wage of 6.81 per cent. In Papua Province, it can be seen from the decrease in household consumption expenditure by 5.48%.

Especially Indonesia, where the contribution of household consumption reaches 57.66 per cent of GDP (consumption-driven economy). Increased consumption spending has driven economic growth over the last few decades (Mohd Bakri et al., 2017). The high and low consumption expenditure also reflects the standard of living (Choudhury & Agarwal, 2018). Based on the explanation above, some things must do to improve human development. One factor that allegedly affects human development is Population Dependence.

Todaro & Smith (2006:81) say that the problems experienced by developing countries are not only about the rapid population growth but also the high burden of population dependence (Ginting et al., 2020). According to international organizations such as ITU, World Bank and IMF, Technology is crucial in enhancing human development, especially in developing countries. It has excellent prospects for reducing poverty and increasing productivity and economic growth. Technology is a crucial mediator in bridging all community activities. The emergence of e-commerce, digital payments, e-learning, e-health and other online platforms change people's behaviour patterns in a digital society. Without it, economic actors cannot carry out their functions effectively (Karaman Aksentijević et al., 2021). The effort to increase Human development in Indonesia does not stop there. This reason is that other crucial issues must be addressed, namely the low quality of human resources in Indonesia. The low quality of human resources will impact the low level of human development. Schultz (1961) said that human capital is a crucial factor in increasing a country's productivity.

## **LITERATURE REVIEW**

Edgar Owens (1987) argues that human development is more critical than physical development because it contributes to development, incredibly sustainable development (Astri, Nikensari, & Kuncara W., 2013). HDI measures Human Development. HDI is a composite index formed based on three indices. Namely the Health Index as measured by Life Expectancy (AHH), the Education Index as measured by Expected Years of Schooling (HLS) and Average Length of Schooling (RLS), and the Expenditure Index measured by adjusted Average Expenditures per Capita. The three composite indexes that make up the HDI interpret that human development is achieved through humans who are healthy and creative, knowledgeable, and have access to a decent standard of living (Badan Pusat Statistik, 2020). Based on people-centred development theory or population-oriented development theory. Where this theory describes the efforts to improve human development, Todaro & Smith (2006: 81) said that the problems experienced by

developing countries are not only about the rapid population growth but also the high burden of population dependence (Ginting et al., 2020). Based on the Life-cycle Hypothesis.

Model theory is that people's expenses depend on their age, and expenses increase with age, but their ability to earn income decreases so that the unproductive and unproductive age will be a burden for the productive population. The higher the burden of dependence, it causes human development declines (Deaton, 2014). Meanwhile, according to Kotler and Armstrong, the ease in product selection, brand selection, time efficiency, and payment methods resulting from technological advances make consumer decisions easier. In line with the theory of human development, income is only one element to meet human needs. At the same time, technology does not only meet human needs but can also improve the overall quality of life. According to Rahardja and Manurung (Adiana & Karmini, 2012), the higher an individual's education, the higher his consumption expenditure will be. It means that the higher the level of individual education, the greater the willingness for physical and non-physical access individuals can obtain to achieve their needs. The increase in consumption expenditure reflects an increase in per capita expenditure. Therefore, the increase in per capita expenditure indicates the level of welfare.

## **METHOD**

The analysis used in this study is a panel data regression analysis technique using Eviews 10. Regression analysis aims to calculate the mean or mean (population) of the dependent variable, which can be seen from a fixed value. So the regression analysis describes the dependence of one variable (the dependent variable) on another variable (the independent variable) (Gujarati & Econometrics, 2004). So the data used in this study is panel data.

## **RESULTS AND DISCUSSION**

Based on testing, the best model is obtained by probability value random cross-section =  $0.0000 < 0.05$  is less than 0.05, which means the fixed Effect Model(FEM) was chosen as the best model in this research. The following are the results of the Classic Assumption Test.

### **1. Normality Test**

Based on the results of the normality test conducted by the researcher, the Jarque-Bera probability value calculated is 0.264898. Therefore, the result is more significant than 0.05, which means that it accepts  $H_0$  to conclude that the residuals are normally distributed or free from the symptoms of the Normality Test.

### **2. Multicollinearity Test**

Based on the results of the Multicollinearity Test above the Variance Inflation Factor (VIF) value, none is above 10 (VIF values range from 1.154 to 1.526). So it can be concluded that there is no multicollinearity.

### **3. Heteroscedasticity Test**

With the heteroscedasticity test hypothesis, if the probability value is more significant than 0.05, then 0 is accepted, meaning there are no symptoms of heteroscedasticity or homoscedasticity.

## **Panel Data Regression Analysis**

The Panel Data Regression Equation aims to estimate the dependent variable if the independent variable is increased or decreased. The results of panel data regression using the Fixed Effect Model (FEM) follow. The following are the results of the FEM test.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.466134	0.385891	24.53061	0.0000
X1	0.089630	0.016395	5.466774	0.0000
X2	0.386659	0.135758	2.848148	0.0054
X3	-0.009793	0.003335	-2.936136	0.0041

**Source: Output Eviews 10**

Based on the results of data processing, the following results are obtained:

$$\text{Log}(Y) = 9.466134 + 0.089630 + 0.386659 - 0.009793 \text{ Log}(X3)$$

Population, technology, and Education dependence constant at 0 will cause the Y (Human Development) value as measured by adjusted per capita expenditure to increase to 9,466134. If X1 (Population Dependency) increases by 1%, the value of Y will increase by 0.089630. If X2 (Technology) increases by 1%, the Y value will increase by 0.386659. If X3 (Education) increases by 1%, the Y value will decrease by 0.009793.

## DISCUSSION

Population dependence can increase human development as measured by adjusted per capita expenditure. It follows the Life-cycle Hypothesis Model theory proposed by Franco Modigliani and Brumberg (1980), which assumes a link between the demographic structure and household spending and savings level. A person's consumption expenditure depends on age; as a person ages, the level of expenditure increases, but the ability to earn income decreases. So the population of unproductive and unproductive age will be a burden for the productive population. A decrease in the number of unproductive or unproductive age dependents in a household will have a higher level of savings due to less spending. This study also said by (Ginting et al., 2020) the increasing dependence of the unproductive and unproductive population is linearly in line with the increasing expenditure allocated by the productive population to meet their needs and themselves. This study is also in line with the results of Research (Xu et al., 2022), which says that the burden of dependence on the elderly population has a significant effect on household per capita expenditure in China. This research is also in line with the results of a survey conducted by the Central Statistics Agency, which shows that in 2021, the dependency ratio of the elderly population in Indonesia will increase by 7.85% from the previous year, which was 15.54% so that the increase is directly proportional to the increase in demand. The elderly are the burden of the productive age population. And then, technology on human development, based on Kotler and Armstrong (2008), assume that the ease of selecting products, brand selection, time efficiency, and payment methods resulting from technological advances make people's decisions to consume easier. Technological developments had had an enormous impact, especially during the Covid-19 period, when the Social Distancing policy limited access to public movement, so people turned to digital societies. Technology is an intermediary in economic activities, one of which is consumption. For example, many people carry out buying and selling activities online. Technological developments' flexibility, efficiency, and promotion can increase spending. The in line with Research (Faizah & Prakoso, 2021) shows that there is a positive and significant influence between technology (E-commerce) and consumer spending in Indonesia during Covid-19. In addition, Research (Li et al., 2020) also shows that technology in online shopping, digital payments, obtaining online credit and

purchasing financing products on the internet has increased household spending per capita in China. Lockdown, large-scale social restrictions, workforce reductions, a decrease in the level of workers' income and a reduction in working hours during the pandemic Covid-19 made per capita spending adjusted to decrease. The theory argues that people's fear of imminent risk will drive them to decide to find ways to deal with risk. The in line with Research (Christelis et al., 2020), which shows that education significantly negatively affects consumer spending in six European Union countries during the Covid-19 period. It is due to a higher sense of concern experienced by highly educated people about the household financial situation due to the income shock. So they are more careful and vigilant in spending. In addition, in line with research conducted by (Najmi Illahi and Multi Roza, 2018), higher education significantly negatively affects household consumption expenditures in Indonesia. The results of this study are also in line with Research (Truong & Truong, 2022) that education harms household spending in the United States during the Covid-19 pandemic. The higher the population's education level, the less likely they are to spend their income by selecting their expenses.

People's fear of the risks encourages them to make decisions by holding back their expenses. The less likely they are to spend their income by selecting their expenses. People's fear of the risks encourages them to make decisions by holding back their expenses. The less likely they are to spend their income by selecting their expenses. People's fear of the risks encourages them to make decisions by holding back their expenses.

## CONCLUSION

Based on the results of research on the effect of population dependence, technology, and education on human development in Indonesia during the Covid-19 period. From these results, as measured by adjusted per capita expenditure, human development is influenced by the dependent variable of population, technology, and education, so the increase in per capita expenditure indicates an improvement in a decent standard of living.

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