

Evaluating the COVID-19 Pandemic's Impact on Indonesia's Economic Growth, Unemployment, and Poverty

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Abstract: Evaluating the COVID-19 Pandemic's Impact on Indonesia's Economic Growth, Unemployment, and Poverty

This study discusses the impact of the COVID-19 pandemic in the form of deaths because of COVID-19 and the number of positive cases of COVID-19 on economic growth, unemployment and poverty in 34 provinces in Indonesia. The novelty of the study innovatively analyzes COVID-19's impact on Indonesia's economic growth, unemployment, and poverty using a Three-Stage Least Squares (3SLS) regression, offering robust insights and valuable guidance for comprehensive recovery strategies. The future impact of this study is to provide crucial insights that will guide more effective policy decisions and set a new standard for economic impact research. This research method uses panel regression 3SLS (Three-Stage Least Square), in which this method is used to estimate a system of simultaneous equations. The endogenous variables used in this study are economic growth, unemployment, and poverty while the exogenous variables used in this study consist of labour, wages, COVID-19 death rate, and positive cases of COVID-19. The results obtained in this study show that the COVID-19 pandemic, which consists of the COVID-19 death rate and the positive cases of COVID-19, had a significant effect on Indonesia's economic growth. In addition, the death rate of COVID-19 and positive cases of COVID-19 also have a significant effect on unemployment in Indonesia. Finally, the death rate for COVID-19 and positive cases for COVID-19 also have a significant effect on poverty in Indonesia. The research limitation of this study is that this study only uses the first two years of the COVID-19 pandemic in Indonesia. The implication of this research, the government must prioritize efforts to control the spread of COVID-19 to mitigate its adverse effects on economic growth, unemployment, and poverty.

Keywords: COVID-19, Three Stage Least Square, Economic Growth, Unemployment, Poverty

INTRODUCTION

In recent years, the COVID-19 pandemic has caused great damage to the world economy. Due to the pandemic, global economic growth has decelerated Liang, et.al, (2023). Coronavirus disease is a type of infectious disease caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2). Indonesia has become one of the countries with the highest rate of cases of total cases in Southeast Asia (Yap, 2020). Compared to 2020, COVID-19-positive cases in the Indonesian province have increased considerably in 2021. From the data, it can be seen that the rate of positive COVID-19 cases has increased in 2021 compared with the previous year, in 2020. The rise of positive cases of COVID-19 is at 0.28%, which indicates an increase of 10% if compared to the year before 2020. An increase in cases indicates that the coronavirus in Indonesia in 2021 is spreading more in Indonesia. In addition to positive cases, the coronavirus can also cause death. By 2021, the number of deaths from COVID-19 has increased considerably compared to the previous year, 2020. It marks the spread of the COVID-19 pandemic in Indonesia. The readiness of hospital infrastructure and hospital capacity in providing health services and preventing the spread of COVID-19 is one of the factors used to see whether or not a region is ready to face a COVID-19 pandemic (Aqmarina, et al., 2022). In 2021 there has been an increase in the number of deaths from COVID-19 by 121,956 people when compared to the previous year 2020. This indicates that hospital facilities and facilities in Indonesia are still inadequate.

In addition to affecting the population, the COVID-19 pandemic has also affected the economy. The impact of the crisis is expected to be similar to the one experienced during the 2008–2009 financial crisis (Almeida *et al.*, 2021). One sector of the economy that has experienced the impact of the COVID-19 pandemic is economic growth. The economic growth rate in Indonesia is experiencing stagnant movements. Starting in 2017 and continuing until 2019, Indonesia's economic growth rate is experiencing stagnant movements. However, in 2020, the rate of economic growth in Indonesia experienced a rather drastic decline when compared to 2019. The COVID-19 pandemic has an impact on economic growth. However, in the following year, in 2021, it can be seen that the rate of economic growth in Indonesia has been increasing again. It indicates that the economic growth rate that has been declining as a result of the emergence of the COVID–19 epidemic in 2020 has not lasted for a long time because in the next year, 2021, the growth rate of the Indonesian economy has increased despite the continued occurrence of the COVID-19 epidemic. The influence of the COVID-19 pandemic on Indonesia's economic growth rate does not exclude the possibility that the COVID-19 epidemic also has an

impact on the economic problems in Indonesia. Unemployment is one of the economic problems that is slowing down the development of the region (Suryahadi, et.al, 2020).

Unemployment occurs when members of the labor force are actively looking for a job but can't find it. A policy of social restraint either on a small or big scale caused by the outbreak of the COVID-19 pandemic in Indonesia has caused many people to lose their jobs (Bayar, et.al, 2023). From the data above, It can be seen that from 2017 to 2019 the unemployment rate in Indonesia has been declining. However, in 2020 and 2021 it can be observed that the unemployed rates in Indonesia have continued to increase when compared with the previous year. There has been an increase in the unemployment rate due to the emergence of the COVID-19 pandemic in Indonesia which has caused many people to lose their jobs due to employment termination by companies. Apart from unemployment, the other economic problem in Indonesia is poverty. Poverty is a condition in which a person is incompetent in meeting the minimum standard of living. Poverty can also be understood as the inability to meet one's social needs, which can lead to feelings of isolation, dependence, and lack of opportunity to participate in a decent social life (Balasubramanian, et.al, 2023). In addition to the significant mortality and morbidity of the COVID-19 pandemic, there will be huge costs to the economy, requiring drastic measures and actions, backed by the strong will and desire of governments and their people (Ataguba, 2020).

The poverty rate in Indonesia has declined from 2017 to 2019. However, in 2020, poverty rates in Indonesia have increased compared to the previous year in 2019. Signs that the COVID-19 pandemic has an impact on poverty levels in Indonesia. Looking at the previous context, economic growth is one of the indicators used to see the prosperity of a country. Knowing this, it is important to remember that the movements that occur in economic growth need to be kept in mind especially when there are global issues that have a big impact on the economy of the country. Unemployment and poverty are core issues in the Indonesian economy and Indonesia is always trying to push both these issues to better economic growth. The unemployment rate has an effect on poverty rate (Ningtias and Anwar, 2021). Based on this background, researchers are interested in studying whether the COVID-19 pandemic has an impact on economic growth, unemployment, and poverty in Indonesia. Besides, are there other factors that influence economic growth, unemployment, and poverty in the Indonesian province at the time of the COVID-19 pandemic? The emergence of these questions led researchers to eventually conduct research on topics derived from the above questions.

Previous studies have tracked that the COVID-19 pandemic affects the world economy

(Pardhan and Drydakis, 2021). According to the findings of his research, the Covid pandemic has harmed the global economy in both human and economic terms. The COVID-19 pandemic's emergence can be mitigated, according to the findings of the researchers. Malahayati, et.al, (2021) and other studies on the effects of COVID-19 on the Indonesian economy discovered that the covid pandemic has a significant impact on Indonesia's economy. Using the CGE model, it is predicted that a decline in demand and several negative supply-side shocks will keep the Indonesian economy stagnant until 2021. Transportation and tourism are the two industries that have been impacted the most by the COVID-19 pandemic's emergence. Researchers also discovered that if the government can provide some financial incentives, the situation will change.

Dash and Sethi, (2022) his research revealed that the number of COVID-19-positive cases and the number of COVID-19-related deaths had a significant negative impact on economic growth. Miranti, et.al, (2022) The COVID-19 pandemic has led to an increase in unemployment. Researchers likewise contend that the increment was brought about by the lockdown strategy which restricted various public exercises. Public activities are restricted, preventing businesses from generating cash flow, which in turn makes them unable to cover wages and ultimately leads to layoffs, which has led to an increase in unemployment in Indonesia.

Su *et al.*, (2022) discovered that the COVID-19 pandemic had a significant positive impact on unemployment. In addition, the researchers made a distinction between poverty in urban and rural areas in this study. In their exploration, researchers tracked down that the COVID-19 pandemic affected destitution in metropolitan regions, however then again, it was not critical for poverty in country regions. Specialists observed that there was a critical beneficial outcome on poverty in metropolitan regions and unemployment and that destitution in country regions was not huge for the COVID-19 pandemic because of government strategies in diminishing the impact of the spread of COVID-19 which zeroed the additional of metropolitan regions where the presence of this strategy straightforwardly upsets the monetary exercises of individuals who live in urban areas. The study's findings demonstrate that the COVID-19 pandemic has affected Indonesia's economy. The consequences of past examinations show that the COVID-19 pandemic has caused a decrease in economic growth, expanded unemployment, and expanded poverty in Indonesia.

However, the COVID-19 years of 2020 and 2021 have been the sole focus of the research to date. In particular in Indonesia, research that took place before the COVID-19 pandemic was still extremely uncommon. The current research focuses on the impact of a single industry on

the COVID-19 pandemic in particular provinces. As a result, researchers are interested in investigating how COVID-19 affects economic growth, unemployment, and poverty in 34 Indonesian provinces. It is hoped that researchers will be able to observe how the COVID-19 pandemic affects economic growth, unemployment, and poverty in Indonesia's province using the 3SLS Simultaneous panel method. The novelty of study offers a thorough and innovative analysis of COVID-19's impact on Indonesia's economic growth, unemployment, and poverty by using a Three-Stage Least Squares (3SLS) regression approach to address interdependencies and endogeneity. The findings provide robust insights and valuable guidance for policymakers to develop comprehensive recovery strategies. The future impact of this study's innovative use of the Three-Stage Least Squares (3SLS) regression to analyze COVID-19's impact on Indonesia's economic growth, unemployment, and poverty provides crucial insights that will guide more effective policy decisions and set a new standard for economic impact research.

LITERATURE REVIEW

Todaro states that economic growth is an expansion in a nation's GDP. Both citizens and non-citizens contribute to the economic growth of a nation within its borders (Villalobos and Riquelme, 2023). In the meantime, economic growth has also been defined as the growth of internal economic activities that raise people's standard of living by increasing the production of goods and services of a higher quality and quantity (Wijatmoko, et.al 2023). Economic growth is characterized by an increase in GDP and GNP, supporting a different point of view. This turns out as expected whether or not the economy is encountering underlying changes or the pace of development is higher or lower than the pace of populace development. A country's economic growth requires three main components. The three parts are as follows; capital accumulation, in which the model's accumulation takes the form of additional physical capital stocks like buildings, machinery, and equipment; an expanding population that leads to an increase in the number of workers; and widespread and effective use of technology that will influence and facilitate an activity's productivity (Chen *et al.*, 2023).

Labor is one factor that affects economic growth. A country's economy will expand more quickly if it can hire more people. Work is one of the elements that add to financial development. In contrast, Samuelson asserts that the quality of the workforce, which includes factors such as knowledge, skills, and work discipline, is the most crucial factor in economic growth (Amor *et al.*, 2023). It is impossible to make effective use of the resulting capital products without employees who are educated and trained. Companies may not be able to make a profit as a result of

ineffective capital goods, which can have an impact on economic growth. The theory of neo-classical economic growth also asserts that capital, technology, and labor are the three components of economic growth. According to Mankiw unemployment is characterized by resource waste. A person's potential to contribute to both national and regional income is wasted when they waste resources. The global economic problem of unemployment has a direct impact on everyday life. A sign of deteriorating living conditions is job loss (He *et al.*, 2023).

A country's unemployment rate is influenced by economic growth. When economic growth increases, the output of all economic activities will increase, which will lead to an increase in the number of workers demanded, which will later cause the number of unemployed to decrease, and the number of existing workforce will be affected. Wages are also a factor that affects unemployment, along with economic growth. According to Mankiw, wage rigidity—the inability of wages to adjust in response to shifts in worker supply and demand—exacerbates unemployment (Alfò, et.al, 2023).

Arthur Okun pioneered the unemployment theory known as Okun's Law which predicts that an increase in employment will result from a decrease in the minimum wage. The relationship between economic growth and the unemployment rate can be observed using theory. Okun discovered from his research that unemployment is negatively correlated with economic growth, with less economic growth leading to more unemployment (Porrás-Arena and Martín-Román, 2023). An increase in wages will result in a decrease in the number of people employed in a nation. An increase in wages will also increase unemployment. Wage increases can result in two outcomes; to begin with, when wages increment, this will urge organizations or bosses to search for fewer specialists, where which shows an expansion in compensation. increment unemployment. Second, an increase in wages will result in a decrease in unemployment because more workers will begin looking for work as a result (Bassier, 2023).

According to Todaro, poverty is when a person doesn't have enough money to buy food, clothing, and a place to live. The central features of poverty, which are closely related to the forms and characteristics of human life, are not new and have existed for quite some time. Even though the effects of poverty vary by country, poverty is a global issue that affects all nations. There are two types of poverty; the first is absolute poverty, in which a person's income is significantly less than what is required to meet and obtain basic needs. The second is relative poverty, in which a person's income is significantly higher than what is required to meet and obtain basic needs, including consumption of personal necessities and social services (Gibson, et.al, 2023; Mgomezulu and Chitete, 2023; Tabash, et.al, 2023). According to Nurkse, wages

affect poverty. Where the lower wages will make the unfortunate populace higher. In addition, wages were found to have an impact on poverty in the vicious circle of poverty theory proposed by Nurkse. Wages will continue to fall because people are less able to save money. If individuals can't save, there won't be sufficient cash to develop the economy, and the nation will sink further into poverty (Naseemullah, 2023). The primary cause of the low income earned is underdeveloped human capital, which results in low productivity. A person's habits of investing and saving will change if his or her income decreases. A person's income will continue to fall, putting them closer to poverty because they won't be able to buy food, a place to live, or clothes.

METHOD

The purpose of this study was to investigate how the COVID-19 pandemic affected economic growth, unemployment, and poverty in 34 Indonesian provinces.

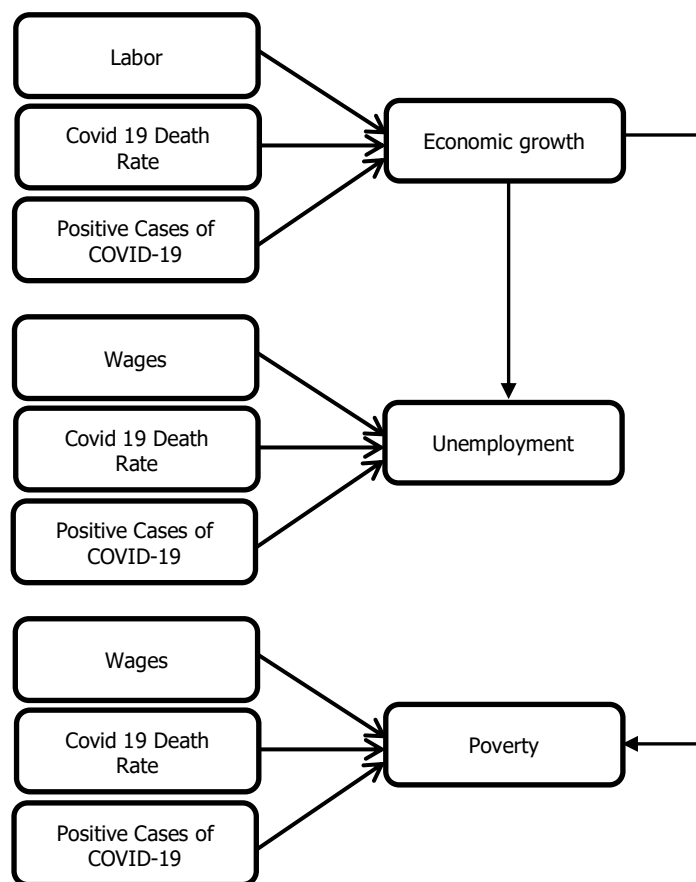


Figure 1. The research framework

This study utilizes quantitative strategies with synchronous relapse conditions. An equation in which the endogenous variables in one or more equations are also the exogenous variables is known as the simultaneous regression equation. The 3SLS method is the simultaneous panel regression equation used in this study. It is used to test the relationship between three endogenous variables and exogenous variables. Estimating structural equations that are simultaneously over-identified is done using the 3SLS method. A development method derived from 2SLS is the 3SLS method. Whereas in the first and second stages, this method employs the same strategy as the 2SLS method, general least squares are utilized in the third stage (Palm, 2023).

There are endogenous variables and exogenous variables in the simultaneous equation model. The obtained simultaneous equation model used in this research can be seen as follows:

$$GDP_{it} = \beta_1 LA_{it} + \beta_2 CoVDR_{it} + \beta_3 CoVP_{it} + \varepsilon_{it} \dots \dots \dots 3.1$$

$$UNP_{it} = \beta_1 GDP_{it} + \beta_2 WAGES_{it} + \beta_3 CoVDR_{it} + \beta_4 CoVP_{it} + \varepsilon_{it} \dots \dots \dots 3.2$$

$$POV_{it} = \beta_1 GDP_{it} + \beta_2 WAGES_{it} + \beta_3 CoVDR_{it} + \beta_4 CoVP_{it} + \varepsilon_{it} \dots \dots \dots 3.3$$

Where GDP is economic growth measured in millions of rupiahs; UNP is unemployment measured in person; POV is poverty measured in person; LA is labor measured in percent, Wages is wages measured in rupiah; CoVDR is Covid-related Death Rate measured in percent, β_0 is the intercept or constant; $\beta_1, \beta_2, \beta_3, \beta_4$ is the regression coefficient; i are Unit cross section (34 Provinces); t is research period; and e is errors.

RESULTS AND DISCUSSION

Using the death rate due to Covid and the number of confirmed positive cases, this study aims to find out how the impact of the COVID-19 pandemic has been on Indonesia's poverty, unemployment and economic growth. A summary regarding the statistical description of each variable in this study is outlined in Table 1 contains a description that describes the standard deviation, minimum value, maximum value, and average used in the study with a total of 170 observations.

In the table below, it tends to be seen that this study utilizes 3 endogenous variables, in particular economic growth variables, unemployment variables, and poverty variables with 170 observations. The economic growth variable has a mean value of 32.68, a standard deviation of 1.13, a range of 30.77 to 35.15, and a minimum and maximum value of 30.77 and 35.15, respectively. The unemployment variable has a mean of 11.58, a standard deviation of 1.15, a

minimum value of 9.61, and a maximum value of 14.74 for the variable. Lastly, for the poverty variable, the poverty variable has a mean of 11.32 with a standard deviation of 1.08, a minimum value of 9.18 and a maximum value of 13.71.

Table 1. Variable Statistical Description

Variable	Notation	Unit	n	Mean	Min.	Max.	SD
Economic Growth	LGDP	Rupiah	170	32,68	30,77	35,15	1,13
Unemployment	LUNP	soul	170	11,58	9,61	14,74	1,15
Poverty	LPOV	soul	170	11,32	9,18	13,71	1,08
Labor	LLA	soul	170	14,53	12,65	16,92	1,02
Death Rate due to COVID-19	COVD	Percent	170	0,61	0,008	1	0,47
Positive Cases of COVID-19	COVP	Soul	170	4,05	0	13,67	5,06
Wages	LWAGES	Rupiah	170	9,73	9,26	10,37	0,23

Source: Secondary data output after processing, 2024; (Diphda, 2024).

In terms of exogenous variables, the labour variables, wage variables, the death rate due to COVID-19, and positive cases of COVID-19 were utilized in this study. The labour variable has a minimum value of 12.65 and a maximum value of 16.92, with a mean value of 14.53 and a standard deviation of 1.02. The wage variable has a minimum value of 9.26 and a maximum value of 10.37, with a mean value of 9.73 and a standard deviation of 0.23. The death rate variable caused by COVID-19 has a mean value of 0.61, a standard deviation of 0.47, a minimum value of 0.0087 and a maximum value of 1. Last but not least, the positive cases of the COVID-19 variable has a mean value of 4.05, a standard deviation of 5.06, a minimum value of 0 and a maximum value of 13.67.

Parameter Significance Test

a. F test – statistic (F – stat)

The estimation results of the F test as shown in table 2, show that at least one of the parameters in each of the three equations has a significant impact on the endogenous variables. This is because H0 is rejected and H1 is accepted because the p-value of the two methods is lower than alpha (0.01). Therefore, it is possible to conclude that exogenous variables are simultaneously influenced by endogenous variables.

Table 2. F test – statistic Results

Equation	R-square	
	3SLS	
LGDP	0,7739	
LUNP	0,7941	
LPOV	0,5047	

Source: Secondary data output after processing, 2024; (Diphda, 2024).

b. T-test statistics (t-test)

The purpose of the t-statistical test was to ascertain whether or not each exogenous variable has a partial impact on the endogenous variables. All exogenous variables have a significant impact on endogenous variables, as shown by the 3SLS estimation results in Table 5.4. The reason for this is that each exogenous variable's p-value is lower than alpha. According to these findings, the exogenous variables of labor, the death rate from Covid-19, and the number of positive COVID-19 cases have a significant impact on the endogenous variable of economic growth. The exogenous variables of economic growth, wages, the COVID-19 death rate, and the number of positive COVID-19 cases all have a significant impact on the endogenous variable of unemployment. Economic growth, wages, the COVID-19 death rate, and the number of positive COVID-19 cases all have an impact on the endogenous poverty variable.

c. Coefficient of Determination (R^2)

Table 3. Coefficient of Determination Results

Equation	F test – statistic Results	
	F-stat	P
LGDP	581,90	0,0000
LUNP	1057,82	0,0000
LPOV	346,72	0,0000

Source: Secondary data output after processing, 2024; (Diphda, 2024).

The determination coefficient lies between 0 and 1. Drawing nearer to 1 shows that the assessed model has a decent impact in estimating the strength or capacity of exogenous factors to impact endogenous factors. Table 3 shows that the 3SLS estimation results in the LGDP equation account for 77.39% of the total variance of the exogenous variable, while the remaining 22.61% is accounted for by the variance of other factors outside the model. In the LUNP condition, the absolute variety of exogenous factors is 79.41%, while the excess 20.59% is made sense of by the change of different variables outside the model. At long last, the LPOV condition has an all out exogenous variable variety of 50.47% while the excess 49.53% is made sense of by the fluctuation of different elements outside the model.

Simultaneous Model Estimation Results

Table 4. 3SLS Estimation Results

Variable	Endogeneous Variable		
	LGDP	LUNP	LPOV
LGDP		1,11*** (0,03)	0,96*** (0,55)
LLA	0,92*** (0,04)		
COVDR	1,48*** (0,51)	-1,30*** (0,46)	-1,96*** (0,68)
LCOVP	0,14*** (0,04)	-0,10** (0,43)	-0,17*** (0,06)
LWAGES		-0,29** (0,14)	-0,95*** (0,20)
Constant	17,78***	-15,75***	-1,55
<i>Adj R-Squared</i>	0,7739	0,7941	0,5047
Prob > F	0,0000	0,0000	0,0000
Observation (n)	170	170	170

With a description: *** significance 1%, ** significance 5%.

Numbers in brackets () denote standard error (SE) values.

Source: Secondary data output after processing, 2024; (Diphda, 2024).

The Effect of Labor on Economic Growth

According to Table 4, the 3SLS estimation indicates that the number of workers has a positive and significant effect on economic growth. With a coefficient of 0.92, the 3SLS estimate demonstrates that the variable number of workers has a positive and significant effect on economic growth at the 1% level. The positive coefficient value for the variable number of workers indicates that economic growth will increase by 0.92 percent for every one percent increase in labor demonstrating that the number of workers influences economic growth positively and significantly. This is due to several reasons, among others; an increase in the labor force means more people are involved in the process of producing goods and services. Despite restrictions and disruptions due to the pandemic in Indonesia, sectors that can adapt (such as the digital sector, e-commerce, and essential sectors) could see an increase in output due to the additional workforce. Second, the pandemic is shifting the investment climate in the health and education sectors. With more workers in these sectors, it has been able to increase productivity and innovation capabilities, which will contribute to economic growth in Indonesia, even though the numbers are not as massive as before the pandemic.

This study's findings are consistent with Smith's theory of economic growth, which holds that humans play a role in determining a nation's prosperity and are the primary contributor to each stage of production (Gu *et al.*, 2023). The findings of this study are also supported by senior economists Solow and Swan's neoclassical economic growth theory. According to neoclassical growth theory, economic growth is influenced by three factors. Capital, mechanical turn of events, and work are these three components. As per this hypothesis, an expansion in the quantity of laborers can energize the economic growth of a district or country (Alataş, 2023). Additionally, this finding is supported studies by Wahyu *et.al*, (2019), where the number of workers influences economic growth positively and significantly. This demonstrates that someone will earn money if they have a job. The extent to which an individual's purchasing power is impacted by an increase in their income is directly proportional to that increase. Demonstrates that a society's purchasing power will rise as a result of an increase in the number of workers, which will ultimately lead to an increase in the economic growth of that society. This is in contrast to Mamgain (2021) that the rate of recovery in the labor market has been relatively much slower due to COVID-19. The economic consequences of labor disruptions are even more serious as they trigger a decline in income and economic growth in India.

Effect of Covid 19 Death Rate on Economic Growth

The 3SLS estimate's findings indicate that the COVID-19 variable mortality rate has a positive and significant impact on economic growth, as shown in Table 4. With a coefficient of 1.48, the 3SLS estimate demonstrates that the COVID-19 variable Death rate has a positive and significant effect on economic growth at the 1% level. Positive coefficient values for the death rate from COVID-19(COVD) indicate that for every one percent increase in the death rate from COVID-19, economic growth will increase by 1.48 percent. demonstrates that Indonesia's economic growth is significantly aided by the COVID-19 variable Death rate (COVD). This study's findings are consistent with those of (Lopez, 2021; Padhan and Prabheesh, 2021; Zeng and Zhang, 2022). According to his research, there was a significant positive relationship between economic growth and the variable of death from COVID-19, which could be caused by a variety of factors. These factors include different levels of economic growth, with different conditions in each region. For instance, areas with a dense population have a higher growth rate than areas with a population that is not as dense.

Aside from that there are government strategies connected with how they manage the COVID-19 pandemic, contrasts in government arrangements can likewise be a variable as to why the demise rate from COVID-19 can create a positive relationship to economic growth. These

arrangements can be as approaches through regulating immunizations, strategies through giving a sufficient well-being framework, strategies through carrying out lockdowns, and different arrangements that can assist manage the Coronavirus pandemic. One more finding by Skórka *et al.*, (2020), the study found that the Covid death rate of 19 had a positive impact on economic growth. The consumption of unhealthy goods is one of the risk factors that contributes to the positive influence. Consumption of unhealthy goods is caused by dangerous diseases that were experienced before the COVID-19 pandemic. Because of this, when they are exposed to the COVID-19 virus, their bodies will not be able to fight it, which will eventually result in death. Most of the time, people who are no longer of productive age experience this factor. so that their passing will result in a decrease in the number of people who are not productively aged, which will boost a nation's economic growth.

On the other hand, reducing the unproductive age can also help to reduce the burden on the healthcare system that is under the responsibility of the state, where the reduction of the healthcare system will help reduce the resources and funds needed to be allocated to health care and will eventually open up the country's opportunity to invest in other economic sectors that boost the growth of the country. In addition, the decrease in the population of productive young people will make the company regenerate by recruiting the productive aging population where which will later increase the productivity of companies and influence an increase in economic growth.

Effect of the Positive Cases of COVID-19 (COVP) on Economic Growth

Given the outcomes obtained through Table 4, the 3SLS Assessment produces results that show a huge positive connection or impact between economic growth and the quantity of positive instances of Coronavirus (COVP). The 3SLS Estimation results indicate that the variable number of positive COVID-19 cases has a positive and significant effect on economic growth of 1%, with a coefficient of 0.14. The positive coefficient value for the variable number of COVID-19 positive cases indicates that economic growth will increase by 0.14 per cent for every one per cent increase in the number of COVID-19 positive cases. This demonstrates that the number of confirmed cases of Covid (COVP) has a positive and significant impact on the province's economic development.

This finding is steady with the discoveries (Li *et al.*, 2020; Mo *et al.*, 2021). In their discoveries, analysts accept that fundamentally the nations they utilized as exploration tests as of now have high economic growth rates based from the major league salary figures they get. Because a high level of income leads to increased public consumption, researchers believe that

an increase in the number of COVID-19 cases will boost economic growth.

Due to the high level of economic growth that poses a risk of infectious disease spread, other studies have also found that the number of COVID-19 cases has a positive effect on economic growth. The researchers discovered that the rapid spread of the COVID-19 virus as a result of the high urbanization rate or population was the cause of the high number of positive cases. One of the reasons for the country's rapid economic growth is its large population. According to the findings of the researchers, as the number of confirmed cases of COVID-19 rises, population consumption will rise as a result of government regulations that forbid people from having direct contact with one another. resulting in an increase in economic growth for the nation. In addition, the policy of lockdown as a result of the increasing number of COVID-19 positive cases has led to the public opening up a wide range of small and medium-sized enterprises (SMEs) in which has resulted in the emergence of new supply chains. The appearance of the supply chain has caused a boost to economic growth as a consequence of more smooth supply and lower production costs resulting in increased productivity, lower product prices, and increased competitiveness. As a result, this can stimulate consumer demand, and increase business investment which in the end also contributes to an increase in economic growth.

Effect of Economic Growth (GDP) on Unemployment

Based on the outcomes got as displayed in Table 4, the outcomes got utilizing the 3SLS gauge show that the Economic Growth variable affects the quantity of unemployment in Indonesia. With a coefficient of 1.11, the 3SLS estimate demonstrates that the economic growth variable has a positive and significant effect on unemployment at the 1% level. According to the positive coefficient for the number of unemployed, the number of unemployed will rise by 1.11 per cent for every one per cent increase in economic growth. This demonstrates that Indonesia's high unemployment rate is positively impacted by the exclusive economic growth. Positive economic growth is usually accompanied by the creation of new jobs as companies expand their production and operations. However, under these conditions, there are still many sectors that have not recovered from the impact of the pandemic such as tourism and hospitality. In addition, investment in infrastructure projects has also been depressed so that additional job opportunities are limited, resulting in low employment. In addition, the government's economic stimulus policies, such as assistance for MSMEs and tax incentives, do not appear to have played a maximum role in increasing employment so the unemployment rate is still high.

The results of this study are consistent with those Marhaeni and Sirait (2013) which found that economic growth has a significant positive effect on unemployment. In light of the

outcomes obtained by specialists, there is a positive impact because of the consequences of capital-concentrated and working escalated economic growth in the nations. For this reason, there are great results. This is shown by an increase in the wage sector, but neither the cost of living nor the prices of commodities have increased in the countries that were studied in tandem with this increase. Additionally, the manufacturing sector's contribution significantly influences economic growth. The manufacturing industry saw the most expansion in firms that used a lot of capital rather than a lot of labour. The explanation is the significant expense of the machines expected for assembling.

The Impact of Wages on Unemployment

The 3SLS gauge uncovers that the wage variable affects the quantity of unemployment in the territory of Indonesia, as proven by the discoveries introduced in Table 4. With a coefficient of 0.29, the 3SLS gauge shows that the wage variable adversely affects unemployment with a meaning of 5%. The negative coefficient for the quantity of unemployment indicates that for each 5% increment in wages, unemployment will diminish by 0.29 percent. This finding is as per the assessment communicated by Ehrenberg and Robert where when wages increment, it will make more laborers begin searching for work (Singh, et.al, 2023). Suggesting an expansion in wages will decrease unemployment. What's more, the consequences of these discoveries are likewise reliable with research directed by Fikri and Anis, (2023) which found that wages affect unemployment. In their examination, researchers saw that as assuming the wages set in a space are excessively low, it will lessen individuals' inspiration to work which causes the unemployment rate to increase.

Hence, so that individuals' advantage in working doesn't diminish, in deciding wages, execution results should be changed by the outcomes that have been created by labourers. Assuming the outcomes contributed by labourers are high or the degree of chance that specialists have is high, then, at that point, the wages given should be expanded. By expanding the wage rate, individuals' inspiration to work will build which will make the unemployment rate decline. In addition, wages can increase the labour force to be more productive. The increase in wages may increase the purchasing power of the society which in the end will have an impact on the increase in the productivity of the company.

Impact of the COVID-19 Death Rate (COVD) on Unemployment

The results in Table 4 indicate that the 3SLS estimate indicates that the variable death rate from COVID-19 (COVD) has a negative and significant impact on the variable number of unemployed individuals in Indonesia. The variable death rate from COVID-19 has a negative and

significant effect of 1% on the variable mortality rate with a coefficient of 1.30, according to the 3SLS estimate results. The negative coefficient for the variable death rate from COVID-19 (COVD) deciphers that each 1% expansion in the variable death rate from COVID-19 (COVD) will diminish unemployment by 1.30 percent. Explains how Indonesia's variable unemployment rate is significantly impacted by the variable variable death rate from COVID-19 (COVD). While the increase in the average mortality rate due to the COVID-19 pandemic in Indonesia is significant, its impact on increasing unemployment is not always immediately apparent. This is due to several factors, such as the ability of certain sectors to continue operating with higher efficiency and a smaller workforce, as well as rapid adaptation to technology and digitization that allows remote work and automation of business processes. In addition, government policies that focus on social and economic support, including cash transfers, wage subsidies, and labor-intensive programs, help sustain employment and boost absorption. In many cases, communities and families also play a role in filling labor gaps with higher participation from other family members. Therefore, while mortality rates have increased, adaptive economic structures and policies have mitigated their impact on Indonesia's rising unemployment.

This finding is in line with research led by Su *et al.*, (2022) in which this examination expressed that the variable death rate because of COVID-19 significantly affected unemployment brought about by a strategy as Lockdown. Lockdown strategy is an administration strategy that guides individuals to limit exercises outside the home and do movements of every kind at home fully intent on diminishing the gamble of expanding passing rates because of COVID-19 . Due to this policy, several businesses have advertised work-from-home positions. Where this has made certain individuals land positions again which thusly decreases the quantity of unemployment.

The effect of positive cases of COVID-19 on Unemployment

Given the 3SLS assessment results recorded in Table 4, the quantity of unemployment is adversely and altogether impacted by the number of positive instances of COVID-19 (COVP). With a coefficient of 0.10, the assessment results show that the variable number of positive instances of COVID-19 (COVP) significantly affects unemployment with a meaning of 5%. The negative coefficient value on the number of unemployed indicates that for every 5% increase in positive cases of COVID-19, unemployment will decrease by 0.10 per cent. This demonstrates that the number of positive cases of COVID-19 (COVPs) has a negative and significant impact on the unemployment variable in Indonesia. While the average positive COVID-19 rate in Indonesia has increased during the pandemic, this has not directly led to an increase in

unemployment thanks to adaptive and strategic socio-economic restriction policies. Policies such as the government-imposed Large-Scale Social Restrictions (PSBB), while limiting mobility, have allowed essential and rapidly adaptable sectors, such as e-commerce, logistics, and information technology, to continue operating and even expand. In addition, the implementation of work-from-home (WFH) and flexible working hours in various industries reduced the direct impact on employment. Government support in the form of social assistance and wage subsidies helped maintain people's purchasing power and kept small and medium-sized businesses stable, preventing mass layoffs. All these measures collectively helped keep the unemployment rate stable despite the rise in COVID-19 infection rates.

The findings Su *et al.*, (2022) research supported these results, where their review uncovered a critical pessimistic connection between certain instances of Coronavirus and unemployment because of the accessibility of online positions because of the public authority's Lockdown strategies which caused a few groups can get back to work where this will diminish the quantity of jobless.

The Effect of Economic Growth (GDP) on Poverty

Table 4 displays the results of the 3SLS estimation that indicate that the Economic Growth (GDP) variable has a significant positive effect on the poverty variable in Indonesian provinces. With a coefficient of 0.96 and a significance level of 1%, the 3SLS estimation indicates that the variable Economic Growth has a significant positive effect on poverty. The positive coefficient for the quantity of needy individuals implies that when the economic growth variable expands each 1% it will increase poverty by 0.96%. Demonstrates that economic growth has a positive and significant impact on poverty in a number of Indonesian provinces. The increase in economic growth amid the COVID-19 pandemic in Indonesia has actually contributed to a rise in poverty due to the unequal distribution of economic benefits and increased social inequality. While some sectors, such as technology and healthcare, are experiencing rapid growth and creating jobs, many other sectors hit hard by the pandemic, such as tourism, hospitality and transportation, have yet to fully recover. As a result, workers in these affected sectors have either lost their jobs or experienced a drop in income, forcing them into poverty. In addition, most of the economic assistance and stimulus may have gone to large corporations and the formal sector, while micro, small and medium enterprises (MSMEs) and workers in the informal sector, the economic backbone of the poor, did not receive enough support. In fact, the most effective activities to reduce poverty are poverty reduction programs based on small business empowerment (Anwar and Sari, 2021). Thus, while there is economic growth, not all levels of society benefit, and

vulnerable groups are pushed further into poverty.

These results also support Okun's theory, which is the trade-off theory between growth and equity. According to this theory, there is a trade-off between economic growth and wages called the "big trade-off." Inequality in income distribution will grow, especially if the country experiences rapid economic growth (Porrás-Arena and Martín-Román, 2023). Moreover, the consequences of this study are likewise upheld by research directed by Mita and Usman (2018), which claim that economic growth significantly and positively affected poverty. The emergence of income distribution differences has a significant positive effect, where this results in losses for less fortunate individuals. Additionally, disparities in income distribution, such as those in higher socioeconomic status receiving more than those in lower socioeconomic status, make it challenging for those in lower socioeconomic status to meet their increasingly expensive living expenses, which in turn contributes to an increase in poverty. In nations with high living costs, incidents like this are common.

The Effect of Wages on Poverty

The 3SLS estimation results show that the wage variable has a significant negative effect on the poverty variable in Indonesian provinces, as shown in Table 4. The 3SLS estimate reveals a negative effect between the wage variable and the number of poor people, with a coefficient of 0.95 and a significance level of 1%. Indicates that there will be a decrease in poverty by 0.95 percent for every one percent increase in the wage variable. Shows that the wage variable has a negative and significant effect on the poverty variable in several provinces in Indonesia. Wage increases amid the COVID-19 pandemic in Indonesia have had a significant effect on poverty reduction because increased income directly improves people's purchasing power and household welfare. With higher wages, workers can better fulfill their basic needs, such as food, housing, and healthcare, thus reducing the economic burden that often pushes people into poverty. In addition, wage increases boost domestic consumption, which drives economic growth and creates more job opportunities, especially in vulnerable sectors. Government policies that support minimum wage increases as well as incentives for companies to maintain or increase employee salaries also contribute to economic and social stability. All of this, in turn, helps reduce income inequality and lift people off the poverty line, even amid the challenges posed by the pandemic.

This finding is comparable to Nurkse's theory which states that poverty depends on the vicious cycle of poverty theory which consists of market imperfections, lack of capital, and underdevelopment of human resources which causes low productivity (Naseemullah, 2023). The low productivity of a person will cause the income received to be quite low whereas low income

can result in poverty that occurs due to a lack of capital to make ends meet. Apart from that, these findings are also consistent with findings that Hanifah and Hanifa, (2021) state that wages have a significant negative effect on poverty. There is a significant negative effect caused by an increase in wages. Where with an increase in wages the ability of the community to meet the necessities of life will be fulfilled which will lead to a reduction in poverty.

The Effect of COVID-19 Death Rate (COVID) on Poverty

Based on the estimation results in Table 4, the 3SLS estimation results show that the COVID-19 Death Rate (COVID) variable has a negative and significant effect on the poverty variable in the provinces of Indonesia. The results obtained using the 3SLS estimate show that the COVID-19 Death Rate (COVID) has a negative and significant effect of 1% on poverty, based on a coefficient of 1.96. The negative coefficient value for poverty indicates that for every 1% increase in the COVID-19 Death Rate, there will be a decrease in poverty by 1.96. This indicates that the COVID-19 death Rate variable has a significant negative effect on the poverty variable in several provinces in Indonesia. The increase in the average COVID-19 mortality rate in Indonesia has not had a significant impact on the increase in the poverty rate thanks to the socioeconomic restriction policies that have been implemented. Despite serious health challenges, the government is taking decisive measures to protect the most vulnerable people and maintain economic stability. Socio-economic restriction policies, such as controlled lockdowns and tight regulation in high-risk sectors, have helped keep essential economic activities running while controlling the spread of the virus. Extensive social assistance and other economic support programs have been put in place to ensure that negative economic impacts are not widespread, by providing protection for those affected and promoting a faster recovery in the future. Therefore, despite serious health challenges, socioeconomic restriction policies have successfully mitigated their impact on poverty levels amid the COVID-19 pandemic in Indonesia.

The results of this study are the results of research conducted by Osayomi *et al.*, (2021) where in their research the researchers found that the death rate due to COVID-19 had a negative and significant effect on poverty. The existence of a significant negative effect was caused by policies carried out by the government in the form of a Lockdown policy which was established as a result of the increasing death rate. As a result of the Lockdown policy, several families have helped each other families who need assistance in making ends meet. So that their living needs can be fulfilled which causes a decrease in the number of poverty. This is in contrast to the finding Decerf *et al.*, (2021) that the pandemic has caused an increase in the number of

poor people by 68 million, along with the number of people who died by 4.3 million in 150 countries.

The Effect of the Number of Positive Cases of COVID-19 (COVP) on Poverty

The 3SLS estimation results show that the variable number of positive cases of COVID-19 (COVP) has a significant negative effect on poverty in Indonesia, as shown in Table 4. The results obtained through the 3SLS estimation state that the poverty variable is significantly and negatively affected by 1% of the number of positive cases of COVID-19 (COVP) with a coefficient of 0.17. The negative coefficient for the number of poor people describes that every 1% increase in the variable number of positive cases of COVID-19 (COVP), indicates a decrease in poverty by 0.17 per cent. This shows that the poverty variable has a negative and significant effect on the number of positive cases of COVID-19 (COVP) in several Indonesian provinces. Although the average number of positive COVID-19 cases in Indonesia has increased during the pandemic, effective socioeconomic restriction policies have prevented a significant impact on the increase in poverty. These findings are consistent with the findings by (Bukari *et al.*, 2021; Osayomi *et al.*, 2021). According to their findings, the number of positive cases of COVID-19 can have a negative and significant effect on poverty due to the policies implemented by the country's government.

CONCLUSION

The findings of this research state that labor has a significant positive impact on economic growth in the 34 provinces of Indonesia. Furthermore, the COVID-19 mortality rate and the number of positive COVID-19 cases have also had a significant positive impact on economic growth in 34 Indonesian provinces. Economic growth had a significant positive impact on unemployment in the 34 provinces of Indonesia. However, wages, COVID-19 mortality rates, and COVID-19 positive cases have a significant negative impact on unemployment in 34 Indonesian provinces. Economic growth had a significant positive impact on poverty in the 34 provinces of Indonesia. However, wages, COVID-19 mortality rates, and COVID-19-positive cases have a significant negative impact on poverty in 34 Indonesian provinces.

The COVID-19 pandemic had an impact on the world's economy. Although in some countries the COVID-19 pandemic has shown an impact that has caused a decline in the economy of the country, in Indonesia it can be seen in some provinces that the Covid-19 pandemic has made an increase in economic growth and a decrease in the number of unemployment and poverty. In this regard, it should be noted that the proper policies given by

the government play a major role in the economy of the country where in some provinces policies such as the implementation of a lockdown at different levels, the policy of distribution of aid to some remote areas, and the policy related to the provision of vaccines all have an impact on the Indonesian economy. Therefore, it is hoped that the government will be able to take appropriate policies in line with what the province needs. So if the next time Indonesia faces a back pandemic, our country's economy will not be too negatively affected and can be better.

Several policy implications can be derived to address for the government; implement policies that promote labor participation and productivity to further stimulate economic growth. This can include training programs, incentivizing entrepreneurship, and improving labor market flexibility. Prioritize efforts to control the spread of COVID-19 to mitigate its adverse effects on economic growth, unemployment, and poverty. Foster an environment conducive to sustained economic growth by promoting investment, innovation, and diversification of industries. Enhance social safety nets to support those who are unemployed or underemployed, particularly in times of economic downturns or crises. Recognize the interconnectedness of labor market dynamics, COVID-19 impacts, economic growth, unemployment, and poverty, and adopt a comprehensive and integrated policy approach to address these challenges effectively. The future impact of this study is the need for effective policies from the government and private sector to increase economic growth, reduce unemployment, and reduce poverty after the COVID-19 pandemic. The government should focus on investing in infrastructure, education, and technology to create new jobs and upskill the workforce. Social assistance programs and wage subsidies should be continued to support vulnerable households and ensure economic stability. On the other hand, the private sector needs to innovate and adapt to digital technology and build partnerships with the government to improve efficiency and productivity. Through close collaboration between the government and the private sector, economic recovery strategies can be implemented more effectively, ensuring inclusive and sustainable growth that benefits the whole society.

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