Does the Covid-19 Outbreak Impacts on Economic Growth? An Evidence from Indonesia

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Abstract

This study aims to analyze the effects of the COVID-19 pandemic, labor, domestic direct investment (DDI), and foreign direct investment (FDI) on economic growth in Indonesia. The type of data used in this study is panel data, which is a combination of cross-section and the time series data. The cross-section data involves 34 provinces and time-series data covers the period from the first quarter of 2018 to the second quarter of 2021. The result found out that the regression coefficient of labor has a positive and significant effect at the 5 percent level, which means that if the number of workers increases by 1 percent, economic growth will increase by 0.03 percent. Furthermore, the FDI variable also has a significant and positive effect on economic growth in Indonesia. We can see that the FDI variable is significant at the 5 percent level with a regression coefficient of 0.012, this means that an increase in FDI by 1 percent will accelerate economic growth by 0.012 percent. From the results of data processing obtained by the author, it can be seen that the DDI variable has a positive but not significant effect on economic growth in Indonesia, this can be seen from the p-value which is greater than 5 percent. The regression coefficient of -0.001 proves that the COVID-19 pandemic has a negative impact on economic growth in Indonesia. When the COVID-19 pandemic reached the territory of Indonesia, economic growth slowed by 0.001 percent.

Keywords: COVID-19, economic growth, FDI, DDI, labor

1. Introduction

At the end of 2019, to be precise on December 31, 2020, China announced the first case of Coronavirus Disease (COVID-19). According to WHO, the COVID-19 pandemic is caused by a coronavirus called SARS-CoV-2. This type of virus can cause several respiratory diseases in humans, such as the common cold to other more dangerous and serious diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). According to Burki (2020), These two diseases print a fairly high mortality rate every year. The cases of death from MERS and SARS respectively accounted for 10 percent of the total more than 8000 cases and 34.5 percent of the total 2465 cases (Rahman & Bahar, 2020).

Based on data reported by WHO (2021), until July 21, 2021, the total number of deaths caused by this virus reached 4.1 million people and increased to 7,000 per day worldwide. In addition to a fairly high death rate, this virus is also spreading so fast. In fact, according to recent research, transmission can occur through the air. Confirmed cases until July 21, 2021, reached 191 million cases worldwide with daily cases reaching 300 thousand cases per day (WHO, 2021).

In addition to its worrying impact on the health sector, the pandemic has the potential to cause a significant slowdown in the Chinese economy and even the world. The case itself entered Indonesia at the end of the first quarter, the Indonesian government confirmed this on March 2, 2020. Since this first case spread, the number of COVID-19 cases in Indonesia continues to grow every day. The government has also begun to implement related policies to break the chain of the spread of this virus. On March 15, 2020, the government made a policy for the community to carry out all activities at home, such as studying from home for students, working from home for possible workers, and worshiping at home. However, the number of COVID-19 infections continued to increase until the end of March 2020, so the government finally made a new policy, namely PSBB (Large-Scale Social Restrictions), a homecoming ban, and a new normal.

These three policies are beneficial for saving lives as well as public health, but have a fairly large negative impact on economic activity in Indonesia, as evidenced by the failures experienced by various economic sectors. At the end of June 2020, the Indonesian Institute of Sciences (LIPI), the Indonesian Demographic Institute, and the Ministry of Manpower conducted a joint survey which resulted in around 13.9 percent of companies carrying out the termination of employment for their employees and 39.4 percent of companies being completely failed due to the pandemic. The existence of limited capital, both labor, and investment, will ultimately result in a shock to aggregate demand and supply. What's the impact of course? The economy will experience a slowdown and even a deep contraction. Then, the second impact is that the Covid19 pandemic has caused prolonged uncertainty that has finally affected investment in Indonesia. Since the Covid-19 case was first announced, investment in the form of domestic investment (domestic investment) and foreign investment (PMA) has decreased in the second quarter of 2020. This is due to investors' concerns about the condition of the Indonesian economy during the pandemic. The existence of limited capital, both labor and investment, will ultimately result in a shock to aggregate demand and supply. What's the impact? Of course, the economy will experience a slowdown and even a deep contraction. In 2019, Indonesia's economic growth was stable at around 5 percent.

When the COVID-19 virus entered Indonesia, and all government policies related to breaking the chain of spreading this virus, the Indonesian economy began to have an impact. Indonesia's economic growth began to experience a slowdown, from 4.96 percent in the final quarter of 2019 slowing down to 2.97 percent in the first quarter of 2020, when the cumulative number of cases in the first quarter reached 1,528 cases. In the second quarter, the number of COVID-19 cases in Indonesia jumped dramatically to 54,857 cases. In the second quarter of this, various policies began to be tightened by the government, so that various economic activities were increasingly limited. Indonesia's economic growth finally slumped and contracted to -5.32 percent. Entering the third quarter of the Indonesian economy began to rise. This is supported by various monetary and fiscal policies implemented by the government, including the tax amnesty policy and subsidies provided by the government to the wider community to encourage household consumption.

Based on the various problems above, some of the problems that the author wants to examine in this research are how is the impact of the COVID-19 pandemic, labor, FDI, and DDI on economic growth in Indonesia?

2. Literature Review

2.1 Neo-Classical Economic Growth Theory

In this theory, changes in the capital-production ratio can easily occur. In producing goods or services, a combination of various values of capital and labor can be used. If large amounts of capital is used, the labor required will be even smaller. On the other hand, if the use of capital is small or limited, the required workforce will increase. The production function of this theory can be written as follows: (Arsyad, 1992)

$$Q = Q(K,L) \tag{1}$$

where Q: Output; K: Capital; and L: Labor.

2.2   Labor

The definition of manpower according to Law Number 13 concerning Manpower (2003) is anyone who can work to produce goods and/or services both to meet the needs of himself and the community. Meanwhile, according to the concept and definition of the Central Bureau of Statistics (BPS, 2019), the working-age population is divided into 2 groups, namely:
1) The population of the labor force is residents who work, or have a job but while not working and unemployed, they are in the age range of 15 years and over.
2) Non-labor force residents are residents who are still in school, taking care of the household, or carrying out activities other than personal activities, they are in the age range of 15 years and over.

2.3 Capital goods

The economy will grow if the stock of capital goods continues to be added every time. The addition of this stock of capital goods can be done through investment in sectors that have a large contribution to determining economic growth. According to Sukirno (2008), investment can be interpreted as funds issued by investors to meet the needs of equipment in increasing the production of certain goods and services. Investment is very important in increasing the economic activity of a region because production capacity can be maximized with it. Increased production of goods and services in a region will increase national income and expand employment opportunities. (Todaro, 2000)

According to the definition of investment it is all forms of investment activity, where the source comes from domestic and foreign investors who are used to conducting business in the territory of the Republic of Indonesia. Capital can be in the form of money or other forms that are not, that owned by investors and have economic value (Law Number 25 of 2007).

Indonesia's limited capacity for capital formation causes investment in Indonesia to be divided into two main sources, namely domestic direct investment (DDI) and foreign direct investment (FDI). The entry of foreign capital into economic development in Indonesia is only a temporary driving force for economic growth and capacity building in the formation of domestic savings (AG et al., 2018).

1.3.1 DDI (Domestic Direct Investment)

Based on Law no. 25 of 2007 domestic investment is an investment activity to conduct business in the territory of the Republic of Indonesia carried out by domestic investors using domestic capital. An investor is a person or business entity that invests. Domestic investors are individuals who are Indonesian citizens, Indonesian business entities, the Republic of Indonesia, or regions that invest in the territory of the Republic of Indonesia. Funds invested by the central and local governments in the context of doing business in the country are also included in DDI. Domestic capital used is defined as capital that can be in the form of money or not owned by individual citizens of Indonesia, the Republic of Indonesia, or business entities in the form of legal entities or not.

1.3.2 FDI (Foreign Direct Investment)

Foreign investment is an investment activity conducted by the foreign investors in the territory of the Republic of Indonesia, either using fully foreign capital or in joint ventures with domestic investors. Foreign investors referred to here are individual foreign citizens, foreign business entities, and/or foreign governments making investments in the territory of the Republic of Indonesia. Foreign capital is defined as capital owned by individual foreign nationals, foreign countries, foreign business entities, foreign legal entities, and or Indonesian legal entities whose capital is partly or wholly owned by foreign parties (Law of the Republic of Indonesia No. 25 of 2005, 2007).

2.4 COVID-19 Pandemic

The cause of the COVID-19 pandemic is a coronavirus (CoVs) known as SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2). The emergence of this virus was first observed when there was a case of unexplained pneumonia in the city of Wuhan, China. In the early weeks of the epidemic in Wuhan, the cases were linked to the initial case at the Wuhan Huanan Seafood Wholesale Market. This case is expected to occur between the seller and the buyer in the market (Huang et al., 2020).

CoVs consist of 4 types, namely: alpha-, beta-, gamma-, and delta-CoV. All types of CoVs known to be transmissible to humans are alpha- or beta-CoV types. In 2002, SARS-CoV infected cats and eventually spread to humans. Meanwhile, in 2012 MERS-CoV was found in camels and eventually infected humans as well. SARS-CoV-2 itself has so far been associated with CoVs originating from bat populations. Analysis of the viral genome sequence also showed that SARS-CoV-2 is very well adapted to human cell receptors, which allows it to invade human cells and easily infect humans (Burki, 2020).

The most common symptoms of COVID-19 are fever, fatigue, and a dry cough. Because the symptoms are mild, most cases (about 80%) can be treated without specialized care, particularly in children and adolescents. However, some cases may experience serious illness. About 1 in every 5 cases infected with COVID-19 has difficulty breathing and requires special treatment in a hospital. People over the age of 60, and people with medical conditions such as diabetes, heart disease, respiratory disease, or hypertension are at risk of becoming critically ill if infected with this virus.(WHO, 2021).

Responses to pandemics, such as the current COVID-19, are based on four main pillars, namely (Pearson et al., 2020):
1) Surveillance and detection
2) Case management
3) Prevention of spread in the community
4) Maintaining essential services

At the time of the emergence of COVID-19, no effective drugs or vaccines had been found. Thus, containment and mitigation measures are the main public health interventions that can be taken to save lives and maintain public health. This containment strategy aims to minimize the risk of transmission from infected individuals to other individuals. Meanwhile, the mitigation strategy aims to slow down the disease, and to reduce the occurrence of peak health services.

The effectiveness of these two models can be seen from several previous studies as follows (Pearson et al., 2020):

1) Maintaining social distancing in the workplace is the most effective policy to reduce or even slow down the peak of infection. Working from home and closing offices can reduce infection rates by 23–73%, with significant economic implications.
2) School closures can reduce transmission by 7-15 percent and peak transmission rates can be anticipated at around 40 percent. Closing this school will also have a significant impact on the economy and social problems.
3) Bans on mass gatherings have had less impact than other forms of social distancing. This is because the duration of the contact is usually much less than other forms of social interaction, such as at school or work.
4) Travel restrictions can slow case infections, but they cannot prevent a pandemic.
5) Self-isolation can be the most effective measure for reducing transmission rates in the community. However, in order to limit the epidemic, approximately 70% of COVID-19 cases must be tracked and quarantined.
6) Effective communication is essential, and there must be a balance between preventing panic and encouraging action. During a pandemic, convincing the public that this threat is real is far more important to governments than pacifying them.

2.5 Previous Research

Research conducted by Peterson Ozili reveals that the increasing number of days of lockdown, monetary policy decisions and international travel restrictions greatly affect the level of world economic activity, closing and opening prices, lows and highs of major stock market indices. Meanwhile, restrictions on internal movement and high fiscal policy spending had a positive impact on the level of world economic activity. However, the increase in COVID-19 cases has no significant effect on the level of world economic activity (Ozili & Arun, 2020).

The impact of the COVID-19 pandemic has certainly spread to the Asian region, several studies have shown that the impact of this pandemic is quite large in the Asian region. Based on the latest analysis, when compared with projected growth should be without COVID-19, world losses are estimated to be around 5.5 – 8.7 percent of world GDP in 2020 and 3.6-6.3 percent of world GDP in 2021. With losses from developing countries in Asia by 6-9.5 percent of regional GRDP. This impact stems largely from the decline in domestic demand and tourism and world shocks The real GDP of Asia's developing countries is expected to fall by 0.4 percent in 2021 (Sawada & Sumulong, 2021).

As an Asian region, the impact of the COVID-19 pandemic is also being felt in Indonesia. The increasing number of COVID-19 cases every day will affect the Indonesian economy. An economic slowdown could have a significant impact on the Indonesian economy. In addition, the COVID-19 pandemic gave a negative signal to the stock market. Where in the early cases of COVID-19 in Indonesia, stock prices dropped dramatically (Aditia et al., 2020).

The slowdown in economic growth in Indonesia in the first quarter of 2020 is inseparable from the impact of the COVID-19 pandemic. This pandemic will not only affect the health sector, but also the tourism sector and other sectors. The private sector and tourism are among the most affected due to various policies related to handling COVID-19 issued by the Indonesian govern33ment. The increasing unemployment rate during the COVID-19 period ultimately reduced people's purchasing power. Various commodities experienced very small price developments so that inflation experienced a slowdown from the previous time (Fahrika & Roy, 2020).

3. Methods

This study aims to analyze the effects of the COVID-19 pandemic, labor, domestic direct investment (DDI), foreign direct investment (FDI) on economic growth in Indonesia. The type of data used in this study is panel data, which is a combination of cross-section and time-series data (Silvia, 2020). The cross-section data involves 34 provinces and time-series data covers the period from the first quarter of 2018 to the second quarter of 2021. The Central Statistics Agency (BPS) provides data on economic growth and employment. The data for the realization of DDI and FDI comes from the Investment Coordinating Board (BKPM).

To answer the above problems, the model and analysis used in this study is panel data regression analysis using eviews 10. The model can be written in the following form:

$$ECG_{jk} = \alpha_1 + \alpha_2 LAB_{jk} + \alpha_3 FDI_{jk} + \alpha_4 DDI_{jk} + \alpha_5 DCOV_k + \varepsilon_{jk} \tag{2}$$

ECG_{jk} : Economic growth by province j the k-th period

LAB_{jk} : Labor by province j the k-th period

FDI_{jk} : Foreign Investment by province j the k-th period

DDI_{jk} : Domestic Investment by province j k-th period

$DCOV_k$: value 0 from 2018Q1 to 2019Q4 and 1 from 2020Q1 to 2021Q2

ε_{jk} : Error term equation

$\alpha_{1,2,3,4,5}$: Regression coefficient in equation

1) *Common Effect Model (CEM),* this model based on the assumption that there are no differences in sector or time series. So, overall only produces one model estimate for all observations. The form of the equation is as follows:

$$y_{it} = \alpha + x'_{it}\beta + \varepsilon_{it} \tag{3}$$

where α is the intercept coefficient (constant), β is the slope matrix of px1 size and x_{it} is the i-th observation and t is time of observations on the explanatory variable p.

2) *Fixed Effect Model (FEM)*, this model assumes that there are different effects between sectors and time. Where the FEM intercept value will be different for each *cross-section*. The FEM model is expressed in the form of an equation:

$$y_{it} = x'_{it}\beta + \alpha_i + \varepsilon_{it} \tag{4}$$

Where $\alpha_i = Z'_i\alpha$ embodies all observed effects and specifies the conditional mean that can be estimated. α_i is treated as a fixed parameter that is not known and will be estimated. Zi is assumed to be unobserved and correlation with the independent variable. ε_{it} is an error that is stochastic and independently distributed and identical with a mean of 0 and a variance of σ_ε^2. Independent variable assumed to be independent with errors for all i and t.

3) *Random Effect Model (REM)*, this model assumes that there are differences in sector and time effects that are included in the residual component. This residual is not correlated with the dependent variable. The REM model can be expressed in the form of an equation:

$$y_{it} = x'_{it}\beta + \alpha + \eta_{it} \tag{5}$$

There are several P independent variables including the constant. α is the average of the unobserved individual effects. u_i is a specific random effect for the i-th observation. In this model u_i is assumed to be independent with ε_{it}, in addition it is also assumed that the independent variable x with u_i and ε_{it}.
Selection of the best model from the three models above using the following three test forms (Falah et al., 2016):

1) Chow test
To find out whether the FEM model is better than the CEM model, the Chow test is used. By using the Chow test, it can be seen whether the significance of the intercept α_i is different in each sector (FEM) or the same (CEM). The hypotheses used are:
H_0 : CEM models
H_1 : FEM models
If the *p-value* <0.05, then H_0 is rejected it means FEM models selected and vice versa.

2) Test *Langrange Multiplier* (LM)
By using the LM test it can be selected which model is the best between CEM and REM, by testing the REM model based on the residual value. The hypothesis is:
H_0 : CEM models
H_1 : FEM models
If the *p-value* <0.05, then H_0 is rejected it means FEM models selected and vice versa.

3) Hausman test
Hausman test is used to choose between FEM and REM models. The hypothesis of this test is:
H_0 : REM model
H_1: FEM models
If the *p-value* <0.05, then H_0 is rejected it means FEM models selected and vice versa.

4. Results and Discussion

Panel data regression analysis consists of FEM, CEM and REM models so that we have to choose the best model by performing the Chow test followed by the Hausman test. The Table 1 following shows the test results of the two tests:

Table 1. Best Model Selection

	Chow Test	Hausman Test
P-Value	0.0000	1,000

Based on the results of the Chow test with a p-value <0.05, which means rejecting the null hypothesis so that the conclusion is the FEM model is better than the CEM. Then proceed with the Hausman test, with the results shown in the table above with a p-value > 0.05, meaning that the REM model is better than the FEM model. So the best model used in this study is the REM model which can be seen in Table 2.

Table 2. Estimated Results with Random Effects Model

Variable	Coefficient	Prob.
C	0.320553	0.0000
LAB	0.035610	0.0093
FDI	0.012859	0.0112
DDI	0.002339	0.3895
DCOV	-0.001465	0.0038
R-SQUARE	0.042144	
F-Stat	5.180757	0.000431

As we can see from the probability value of the F test < 0.05, it mean that the variables of labor (LAB), Foreign Direct Investment (FDI), Domestic Direct Investment (DDI), and the COVID-19 dummy variable significantly affect Indonesian economic growth (ECG). The estimation results can be written in the form of an equation as follows:

ECG = 0.320553 + 0.035610 LAB* + 0.012859 FDI* + 0.002339 DDI - 0.001465 DCOV*
*significant at the 5 percent level

The labor variable has a positive and significant effect at the 5 percent level, meaning that if the number of workers increases by 1 percent, economic growth will increase by 0.03 percent. This follows the neo-classical theory that labor is one component of economic growth. The results of this study are supported by previous studies such as those conducted by Salhab and Soedjono (2012), Isma (2014), Sari, et al (2016) and Juliansyah et al (2018) which state that the number of workers has a significant and positive effect on economic growth.

Furthermore, the FDI variable also has a significant and positive effect on economic growth in Indonesia. We can see in table 3.2 that the FDI variable is significant at the 5 percent level with a regression coefficient of 0.012, this means that an increase in FDI by 1 percent will accelerate economic growth by 0.012 percent. FDI as a form of investment has a fairly strong relationship with economic growth, as explained in several economic growth theories that investment is one of the factors that can accelerate economic growth. The results of this study are also supported by several previous studies conducted by Purwanto and Mangeswari (2011), Lean and Tan (2011), Trisnu and Purbadharmaja (2014), Iamsirarij (2016), Tran and Hoang (2019), Kambobo and Marpaung (2020). They stated that FDI had a significant and positive effect on economic growth.

Meanwhile, surprising results were obtained from the DDI variable. From the results of data processing obtained by the author, it can be seen that the DDI variable has a positive but not significant effect on economic growth in Indonesia, this can be seen from the p-value which is greater than 5 percent. How could

that happen? Whereas as previously explained, even FDI has a significant influence, but the DDI itself does not have a significant effect on economic growth in Indonesia.

One of the factors is the value of DDI which does not show a significant increase every year. In addition, the use of PMDN that is not well targeted is also a triggering factor. So, there is a need for an evaluation by the government to continue increasing DDI and use it appropriately so that it can become one of the factors driving economic growth. This study is supported by previous research conducted by Kambono and Marpaung (2020), which found similar results, albeit with a positive but not significant impact on accelerating Indonesia's economic growth. Several studies have also found that an increase in domestic investment can significantly slow down economic growth as found by Lean and Tan (2011).

The last variable that is the focus of this research is how is the impact of the COVID-19 pandemic on economic growth in Indonesia. As we can see in the estimation equation above, the pandemic has had a significant and negative impact on economic growth in Indonesia. This can be seen from the p-value which is smaller than 5 percent and the regression coefficient is -0.001, which means that when the pandemic began to reach Indonesia, economic growth slowed down by 0.001 percent. As we know, the COVID-19 pandemic has forced various countries to enforce policies such as social distancing, lockdowns, and even closing schools, offices, and tourist attractions. These policies are basically implemented to reduce the transmission of the virus and reduce the number of deaths caused by the virus. However, in the end these policies had to be paid dearly by the country's economy. These policies resulted in shocks to demand, supply and even finance, causing economic growth in Indonesia to slow down and even contract in the first few quarters. However, in line with the government's economic recovery program, the Indonesian economy can recover slowly.

The main purpose of this study is to determine and analyze the effects of labor, foreign direct investment, domestic investment and the COVID-19 pandemic on economic growth in Indonesia. Labor is one of the main factors in encouraging the economic growth of a country. As can be seen from the results of this study, the number of workers has a positive and significant influence on economic growth in Indonesia with a regression coefficient of 0.03, which means that an increase in the number of workers by 1 percent will accelerate economic growth by 0.03 percent. Furthermore, this study also looks at the effect of investment on economic growth in Indonesia, where investment is divided into FDI and DDI. Both turned out to have a positive influence on economic growth. However, only FDI has a significant effect while the effect of DDI on economic growth in Indonesia is not significant. One of the reasons why this variable is not significant is the increase in the number of DDI which is not significant every year, and also the use of DDI that is not well targeted.

5. Conclusion

The impact of the pandemic on economic growth is the focus of this research, given the limited research conducted about this. If we look at it, since this pandemic reached Indonesia, Indonesia's economic growth has experienced a significant slowdown. This was apparently supported by the results of this study which showed that the dummy variable of the pandemic had a significant effect with a p-value of less than 5 percent. The regression coefficient of -0.001 proves that the pandemic has a negative impact on economic growth in Indonesia. When the pandemic reached the territory of Indonesia, economic growth slowed by 0.001 percent. This can be explained by the massive supply and demand shock caused by the policies implemented to break the chain of transmission of COVID-19.

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