

INDONESIA'S MANUFACTURING PERFORMANCE AT THE BEGINNING OF COVID-19 PANDEMIC

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INDONESIA'S MANUFACTURING PERFORMANCE AT THE BEGINNING OF COVID-19 PANDEMIC

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Abstract

Purpose - This study aims to analyze the performance of the manufacturing industry and how the influence of investment and inflation on that performance in the early days of the COVID-19 pandemic. **Design/methodology/approach** -The performance of the non-oil and gas processing industry is analyzed using the Gross Domestic Product (GDP) of the non-oil and gas processing industry sector. Investment will be reviewed from Foreign Investment and Domestic Investment. Variable Inflation is used as an indicator of price fluctuations in the Indonesian economy. **Findings** - The analysis reveals the performance of the manufacturing industry, three priority issues: 1. Growth Rate of Non-Oil and Gas Processing Industry Sub-Sector at the start of the COVID-19 pandemic, 2. Realization of Foreign Investment (PMA) and Domestic Investment (PMDN) in the Non-Oil and Gas Processing Industry Sub-Sector, 3. Inflation in Indonesia. Then, how the influence of investment and inflation on that performance in the early days of the COVID-19 pandemic. The priority solution in this finding is to improve the profession, academics, and supporting institutions. **Research limitations/implications** - This study only examines the problems of 12 sub-sectors of the processing industry at the beginning of the COVID-19 pandemic from the first quarter of 2019 to the third quarter of 2021. This study contributes to the literature by exploring problems and discussing solutions. **Practical implications** - This study highlights priority issues and discusses solutions to serve as a reference in making policies and strategies for the development of the manufacturing industry in Indonesia. **Originality/value** - Although there have been several studies in this area, this research is a novelty in examining the problems of the processing industry at the start of the COVID-19 pandemic.

Keywords: PDB, Growth, Manufacturing Industry, Covid-19 Pandemic, Investment, Inflation.

Paper type: Research paper

INTRODUCTION

Entering the middle of 2021, the 2019 Coronavirus Disease Pandemic (Covid-19) is still covering all countries in the world since it was set by WHO on March 11, 2020. All lines of human life are feeling the impact of this Covid-19 Pandemic (WHO, 2020). The world economy has experienced a significant decline due to the pandemic. In January 2020, the International Monetary Fund (IMF) projected that the global economy will grow by 3.3 percent, but with the Covid-19 pandemic, world economic growth throughout 2020 will contract by 3.5 percent (IMF, 2020). Several studies have shown that the COVID-19 pandemic has had a negative impact on the demand for goods and services, business sectors, international trade and the job market (Bentall et al., 2021; Sigala, 2020; Xiang et al., 2021; Hoque et al., 2020; Shang et al., 2021; Webster et al., 2021).

Indonesia, as a country with a large population and open economy, experienced a growth contraction of 2.07 percent in 2020. This condition is inseparable from the contraction

experienced by Indonesia's main trading partner countries such as the United States which experienced a contraction of 3.5 percent, Singapore and South Korea which contracted by 5.8 percent and 1.0 percent, respectively. China, as the country where the Covid-19 Virus was first discovered and spread, experienced high economic growth in 2020 reaching 2.3 percent. The rapid economic recovery in China is influenced by China's policies in dealing with the spread of the Covid-19 Virus including the production of medicines, and Fiscal and monetary policies that encourage investment in infrastructure and real estate (Song et al., 2021; Hale et al., 2021; de Soto et al., 2021; Uchegara et al., 2020).

The Covid-19 pandemic has shaken the industrial sector in various countries policy. Lockdown resulted in the closure of almost all businesses and industries, except for a few industries that deal with the production of essential commodities. This condition resulted in a decline in the industrial sector (Kaur, 2021; Ivanov, 2020; Stern & Zenghelis, 2021). In Indonesia, the manufacturing sector experienced a contraction throughout 2020, partly due to the disruption of the Global Value Chain for both the input and output markets. The domestic processing industry is still dependent on imported raw materials such as the food industry, iron and steel industry, textile industry and other industries (Robiani, 2002; Ferlito & Respatiadi, 2018; ILO, 2019) is another contributing factor. The manufacturing industry is one of the important sectors that has a high contribution to Indonesia's GDP. The Covid-19 pandemic has had a significant impact on the Indonesian economy, one of which is the manufacturing sector, which has an important role in creating added value and absorbing labor. (Olivia et al., 2020; Budi & Mahardhika, 2020; Susilawati et al., 2020).

The decline in growth and contraction in economic sectors had a negative impact on employment. Based on data from the Central Statistics Agency (BPS) during the February 2020-August 2020 period, when Indonesia entered the first Phase of the Covid-19 Pandemic, there was a 3.6 percent decrease in labor absorption (BPS, 2020). Even though 2020 is the first phase of the Covid-19 pandemic, cumulatively the realization of investment realization in 2020 (January-December) was able to reach Rp. 826.3 trillion or 101.1 percent of the target of Rp. 817.2 trillion. Realization of domestic investment (PMDN) reached IDR 413.5 trillion (50.1 percent of the total investment value), and foreign investment (PMA) amounted to IDR 412.8 trillion. Investments that occurred throughout 2020 were able to absorb 1,156,361 workers with a total investment project of 153,349 projects (BKPM, 2021). Covid-19 opens a new dimension for the sustainability of the manufacturing sector. Currently, most industries and supply chains are struggling to anticipate the negative consequences of Covid-19 (Cohen, 2020; Kumar et al., 2020; Liu, 2021). The question that arises is what the impact of the Covid-19 pandemic on the sustainability of the Indonesian manufacturing industry sector is, what is the role of macro variables such as investment and inflation on the sustainability of the manufacturing sector. This study examines how the influence of investment and inflation factors on the added value of the manufacturing sector.

LITERATURE REVIEW

How the impact of the COVID-19 Pandemic on commodity supply chains in the world market, the performance of the manufacturing industry, investment and inflation can be explained from various studies. Wang et al. (2020) examined the impact of the pandemic on the supply chain of the dairy industry in China and the United States, where there was a decline in farm-level milk prices, increased production costs, labor shortages and operational capital. Chowdhury et al. (2020) research proves that the COVID-19 Pandemic is affecting the food and beverage industry, with many expired products, lack of capital, cost difficulties and closing of distributor operations. Based on the report of ECLAC (2021), in 2020 there was a decline in FDI in the manufacturing sector in Latin America and the Caribbean with a decrease in value added of 3.6 percent during the 2019-2020 period. In 2019-2020 research in 96 countries the spread of Covid-19 had a negative impact on FDI flows. Investors don't want to invest in a country where Covid-19 is spreading fast. Investors will not invest in foreign markets when the home market is experiencing a high mortality rate. Meanwhile, for investments that persist, investors tend to reduce their value (Fu et al., 2021). In Indonesia, the Covid-19 pandemic has a relationship with FDI at both the sectoral and regional levels, with reduced FDI in several manufacturing sub-sectors (Syarifuddin & Setiawan, 2022).

According to Hoang et al. (2022) the US government's response to COVID-19 and support for the economy can reduce the impact of the pandemic on investment at the enterprise level. Ball et al. (2021) on the other hand states that the large price swings in industries affected by the COVID-19 Pandemic have caused erratic inflationary fluctuations in the US. According to Bresser-Pereira (2020) monetary financing for high Covid-19 spending will not lead to inflation, but from a fiscal perspective, excessive spending causes inflation, increased imports, the current account deficit and the appreciation of the national currency. The pandemic affected inflation expectations, where household inflation expectations rose sharply with the shock of the pandemic. However, on the corporate side, they responded to the pandemic by lowering future inflation expectations (Meyer et al., 2022). Covid-19 is affecting global supply chains due to inflation (producer price index) across US industries. Industries that rely on inputs from countries most affected by Covid-19 are experiencing large price increases due to an inability to keep up with demand. Unequal distribution of vaccines in developing countries and the emergence of new variants can disrupt delivery, adding to pressure on the supply chain. This creates pessimism that inflation will disappear in a short time (LaBelle & Santacreu, 2022).

METHOD

This study aims to analyze the performance of the Indonesian manufacturing industry at the beginning of the COVID-19 pandemic and the influence of investment and inflation on it. To achieve the research objectives, the analysis variables are used, namely: (1) Value Added in the Indonesian Manufacturing Industry Sector by using Gross Domestic Product data for 12 sub-sectors of the processing industry; (2) Investments are divided into two, namely foreign direct investment (FDI) and domestic investment. The data used are realization data for these two types of investment for 12 sub-sectors of the processing industry; (3) Inflation, which

describes price fluctuations in the domestic economy which is analyzed using Consumer Price Index data. The data used is panel data from the first quarter of 2019 to the third quarter of 2021, which has taken from Indonesian Statistics and Ministry of Investment.

Table 1. Variables, Units and Data Sources

No.	Variable	Unit	Source
1	Gross Domestic Product of Non-Oil and Gas Processing Industry	Billion Rupiah	Indonesian Statistics
2	Foreign Investment	Million Dollar	Ministry of Investment
3	Domestic Investment	Billion Rupiah	Ministry of Investment
4	Inflation	Percent	Indonesian Statistics

This research use Panel Data Multiple Regression Model with the Ordinary Least Square (OLS) method, with the following equation (Kothari, 2013):

$$\text{LnPDB}_{it} = \alpha + \beta_1 \text{PMA}_{it} + \beta_2 \text{PMDN}_{it} + \beta_3 \text{INF}_{it} + e_{it} \dots\dots\dots(1)$$

Where, LnPDB_{it} is GDP of the non-oil and gas processing industry subsector i-year t (billion rupiah); α is Constant Value, β_{1,2,3} is Coefficient regression; PMA_{it} is foreign investment i-year t (million dollars); PMDN_{it} is domestic investment (billion rupiah); INF_{it} is inflation rate (percent) per quarter; e is Error Term.

RESULT AND DISCUSSION

Growth of the Indonesian manufacturing sector until 2019 was only able to reach 4.34 percent. In the National Industrial Master Plan (RIPIN document), the growth target for the non-oil and gas industry in 2015 is 6.8 and in 2020 it is 8.5 percent. This means that the growth of Indonesia's non-oil and gas industrial sector still lower than national target. There are several factors that are considered to influence the development of the Indonesian manufacturing industry: (i) the competitiveness of the national industry is still weak, (ii) the national industrial structure is not yet strong, and the structure of the national industry is not yet deep, and (iii) the industrial activity is still concentrated in Java.

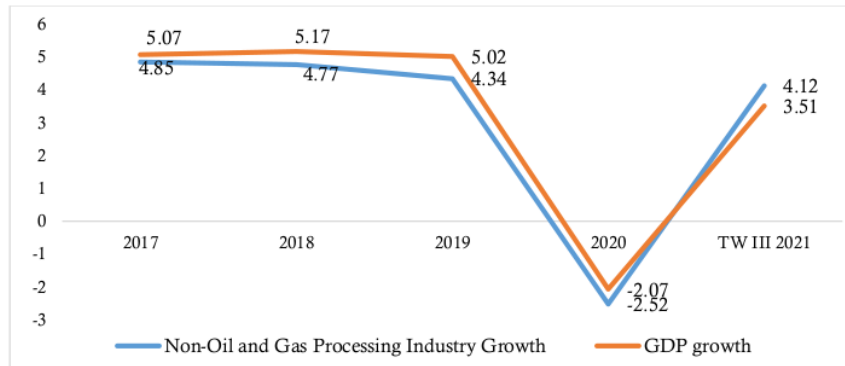


Figure 1: Economic Growth and Growth of the Non-Oil and Gas Processing Industry (yoy) in 2017-3rd Quarter 2021.

Source: Indonesian Statistics, 2022

Based on Figure 1. During the period 2017 – 2019, the growth of the non-oil and gas processing industry was lower than the growth of the national economy. In 2020 as the first year of the COVID-19 Pandemic in Indonesia, the non-oil and gas processing industry experienced a deep contraction of -2.52 percent from the previous 4.34 percent. The disruption of the "Global Supply Chain" is a factor causing the decline in the growth of the non-oil and gas processing industry in 2020, in addition to the competitiveness weakness, and quite high dependence on imported raw materials. In the third quarter of 2021, the GDP growth of the non-oil and gas processing industry experienced a recovery with a growth of 4.12 percent. The growth of the non-oil and gas processing industry is higher than the GDP growth.

The growth of all non-oil and gas processing industries in 2020 experienced a decline except for the chemical, pharmaceutical and traditional medicine industries. The deepest contraction occurred in the transportation equipment industry by -19.86 percent, which can be attributed to the decline in the use of transportation modes in line with the "lockdown" and Large-Scale Social Restrictions policy, as well as decreased activity in other economic sectors. The food and beverage industry are still experiencing growth although it is declining. The recovery of the global economy in 2021 affected the performance of several domestic industries. There are 9 industrial sub-sectors that experienced increased growth in the third quarter of 2021, with the highest growth experienced by the Machinery & Equipment and Transport Equipment Industry. The increasing growth of these two industries indicates the start of economic activity.

Table 2: Growth Rate of Non-Oil and Gas Processing Industry Sub-Sector in 2019-3rd Quarter 2021 (%)

No	Sub-Sector	2019	2020	3 rd Q 2021
1	Food & Beverage Industry	7,78	1,58	3,49
2	Textile & Apparel	15,35	-8,88	-3,34
3	Leather, Leather Goods & Footwear	-0,99	-8,76	18,12
4	Wood, Wood & Cork Products & Woven Goods Industry Bamboo, Rattan, & others	-4,55	-2,16	-1,24
5	Paper & Paper Goods Industry; Printing & Reproduction of Recording Media	8,86	0,22	-5,37
6	Chemical, Pharmaceutical & Traditional Medicine	8,48	9,39	9,71
7	Rubber, Rubber & Plastic	-5,52	-5,61	-2,80
8	Non-Metal Mineral Industry	-1,03	-9,13	2,96
9	Basic Metal Industry, Metal Goods, Not Machinery & Equipment	-0,51	-5,46	-8,06
10	Industry Machinery & Equipment	-4,13	-10,17	16,25
11	Transport Equipment Industry	-3,43	-19,86	27,84
12	Other Processing Industries; Repair & Installation Services of Machinery & Equipment	5,17	-0,88	-6,48

Source: Indonesian Statistics, 2021

From table 3, the average contribution of the non-oil and gas processing industry sector to Gross Domestic Product during 2018-2020 reached 17.70 percent. In RIPIN, the contribution of the non-oil and gas processing industry for 2015 was 21.2 percent and in 2020 was 24.9 percent. This means that the contribution of the non-oil and gas processing industry is still below the national industrial development target.

Table 3: Contribution of the Manufacturing Industry Sub-Sector to Gross Domestic Product in 2018-3rd Quarter 2021 (%)

No	Non-Oil and Gas Processing Industry Sub-Sector	2019	2020	3 rd Q 2021
1	Food and Beverage	6.4	6.85	6.74
2	Tobacco Processing	0.89	0.88	0.77
3	Textiles and Apparel	1.26	1.21	1.05
4	Leather, Leather Goods and Footwear	0.27	0.25	0.24
5	Wood, Wood and Cork and Woven Products from Bamboo, Rattan, and the like	0.51	0.51	0.45
6	Paper and Paper Goods; Printing and Reproduction of Recording Media	0.69	0.72	0.65
7	Chemical, Pharmaceutical and Traditional Medicine	1.68	1.92	2.03
8	Rubber, Rubber and Plastic	0.56	0.54	0.49
9	Non-Metal	0.59	0.56	0.54
10	Base Metal	0.73	0.78	0.80
11	Goods Metal; Computers, Electronic Goods, Optics; and Electrical Equipment	1.68	1.63	1.43
12	Machinery and Equipment	0.3	0.28	0.28
13	Transportation Equipment	1.63	1.35	1.46
14	Furniture	0.25	0.25	0.24
15	Other Processing; Repair and Installation Services of Machinery and Equipment	0.15	0.15	0.13
Non-Oil and Gas Processing Industry		17.58	17.89	17.33

Source: Indonesian Statistics, 2021

In 2020, the contribution of the non-oil and gas processing industry to GDP has increased despite contracting growth. This is partly due to an increase in demand for several sectors such as Chemical, Pharmaceutical and Traditional Medicine, and Food and Beverage related to the worsening pandemic situation throughout 2020. The continued disruption of the Global Value Chain, even though the economy begins to recover in 2021, is one of factors that cause a decline in the contribution of Indonesia's non-oil and gas processing industry.

In general hypothesis is that the COVID-19 pandemic will reduce investment interest. What is experienced by Indonesia is relatively different because the value of foreign investment in 2020 has increased by a 33, 76 percent from the realization in 2019. This increasing can explain the statistical results that Foreign investment has a positive and significant effect on the added value created in the Indonesian manufacturing sector.

The largest increase in foreign investment realization occurred in the chemical, pharmaceutical and traditional medicine industries by 79.34 percent and the metal goods, computer, electronic, optical, and electrical equipment industries by 76.22 percent. These two industries is related to the high demand for health products and electronic products that support the use of information technology in line with policies for Work from Home both in the office and in the education

sector. Foreign investment realization in quarter 3-2022 has reached US\$ 13.696 million or 85 percent of the realization in 2020. The food and beverage industry sub-sector experienced a relatively high increase of 56 percent, in line with the recovery in domestic and global demand.

Table 4: Realization of Foreign Investment (PMA) and Domestic Investment (PMDN) in the Non-Oil and Gas Processing Industry Sub-Sector in 2019-3rd Quarter 2021

No	Sub-Sector	PMA*			PMDN**		
		'19	'20	Q3-21	'19	'20	Q3-21
1	Food & Beverage Industry	1,222	1,288	2,018	44.7	27.9	20.4
2	Textile & Apparel	279	280	244	1.7	2.1	1.5
3	Leather, Leather Goods & Footwear	181	209	285	0.1	0.4	0.5
4	Wood, other Industry Bamboo, Rattan, & others	81	35	47	2.0	1.3	0.7
5	Paper; Printing & Reproduction of Recording Media	382	537	593	2.8	3.7	5.7
6	Pharmaceutical & Traditional Medicine	1,244	2,231	1,301	11.3	22.5	12.2
7	Rubber, Rubber & Plastic	383	362	224	2.6	4.4	3.8
8	Non-Metal Mineral Industry	481	437	254	2.8	5.9	5.4
9	Basic Metal Industry, Metal Goods, Not Machinery & Equipment	3,465	6,106	4,953	8.0	8.9	10.4
10	Industry Machinery & Equipment	585	739	553	0.7	1.2	0.3
11	Transport Equipment Industry	2,920	3,502	2,377	58.6	93.3	45.5
12	Other Processing Industries; Repair & Installation Services of Machinery & Equipment	1,122	574	847	18.2	19.3	22

Note: *) US\$ Million

***) IDR Trillion

Source: Ministry of Investment, 2021

The realization of PMDN in 2020 has increased by 24.39 percent. Despite the increase in the realization of PMDN, investment in the food and beverage industry sector experienced a relatively large decline, which was 37.60 percent. This condition was made possible, among other things, due to disruptions in world supply chains that affected the supply of raw and auxiliary materials to the Indonesian food and beverage industry, the high spread of COVID-19 in the industrial work environment, and decreased demand due to a decline in income.

However, the increase in investment in the pharmaceutical chemical industry and traditional medicine by 100 percent and the transportation equipment industry by 59.09 percent were able

to support the increase in domestic investment realization during the pandemic. The increase in PMDN realization also occurred in the rubber, rubber and plastic goods industry which can be attributed to the increase in demand for health products and household appliances in line with the policy for Work from Home.

Until quarter 3-2022, the realization of PMDN only reached 128.4 trillion rupiah or 67.26 percent of the realization in 2020. Only 4 industrial sub-sectors experienced an increase in realization. The condition of uncertainty and access to funding sources is a factor in the low PMDN in 2021.

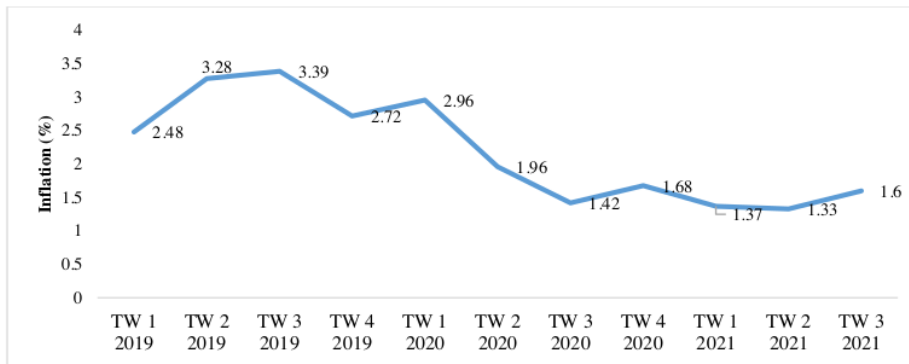


Figure 2: Inflation in Indonesian (yoy) in 2017-3rd Quarter 2021

Source: Indonesian Statistics, 2022

Inflation rate in Indonesia during 2019- quarter 3-2022, was relatively low and under control. Low demand is one of the factors behind low inflation despite disruptions on the supply side. Low and stable inflation is a prerequisite for sustainable economic growth which will ultimately provide benefits for improving people's welfare. The importance of controlling inflation is based on the consideration that high and unstable inflation has a negative impact on the socio-economic condition of the community.

Table 5: Regression Results Using Common Effect Method, Fixed Effect and Random Effect

Common Model			
Variables	Koefisien	Prob.	
C	60.95367	0.0000	
LOG(PMA)	0.18203	0.0000	
LOG(PMDN)	-0.07616	0.0503	
INF	-0.03938	0.0000	
Fixed Effect Model			
Variables	Koefisien	Prob.	
C	53.90412	0.0000	
LOG(PMA)	0.09211	0.0000	
LOG(PMDN)	0.08425	0.0001	
INF	0.13052	0.0003	
Random Effect Model			
Variables	Koefisien	Prob.	
C	56.75749	0.0000	
LOG(PMA)	0.11210	0.0000	
LOG(PMDN)	0.08248	0.0001	
INF	0.00923	0.6618	
Chow Test			
Effect test	Statistic	d.f.	Prob.
Cross-section F	39.151667	-34,172	0.00000
Cross-section Chi-square	455.243911	34	0.00000
Hausman Test			
Test summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	31.089759	3	0.00000

Source: EViews Data Process, 2022

There is a Common Effect Model, Fixed Effect Model and Random Effect Model in panel data regression. To select the best model, the Chow test and Hausman test were carried out. The results of the Chow test cross section F are smaller than ($0.000 < 0.05$), the best model is the Fixed Effect Model (FEM). Then, in the Hausman test, the random cross-section F is smaller than ($0.000 < 0.05$), the best model is the Fixed Effect Model (FEM). The estimation results using multiple regression above can be simplified as follows:

Table 6: Regression Estimation Results Using Fixed Effect Model

Variable	Coef.	Std. Error	t-Stat	Prob.
C	53.90412	1.629374	31.50312	0.0000
LOG(PMA)	0.092107	0.011965	7.667744	0.0000
LOG(PMDN)	0.084247	0.021238	3.957028	0.0001
INF	0.130515	0.035171	3.689921	0.0003
Fixed Effects (Cross)				
_01--C	2.09230			
_02--C	0.61519			
_03--C	-1.05729			
_04--C	-0.61493			
_05--C	-0.27981			
_06--C	0.91770			
_07--C	-0.25532			
_08--C	-0.35843			
_09--C	0.01285			
_10--C	-0.81221			
_11--C	1.09455			
_12--C	-1.35459			
R-squared	0.936384			
Adjusted R-squared	0.922700			
F-statistic	68.425250			
Prob (F-statistic)	0.000000			

Source: EVIEWS Data Process, 2022

Based on the regression equation above, it can be analyzed the effect of each independent variable on the dependent.

$$\text{LnPDB} = 53.90412 + 0.092107 \text{LnPMA} + 0.084247 \text{LnPMDN} + 0.130515 \text{INF} \dots \dots \dots (2)$$

The constant value (β_0) = 53.90 can be interpreted if PMA, PMDN and inflation are considered constant or zero, then the GDP of the non-oil and gas processing industry is 53.90 percent. The coefficient value (β_1) is 0.09 which indicates that the PMA variable has a positive effect on the GDP of the non-oil and gas processing industry, if there is an increase in FDI by 1 percent, it will increase the GDP of the non-oil and gas processing industry by 0.09 percent. The coefficient value (β_2) is 0.08 which indicates that the PMDN variable has a positive effect on the GDP of the non-oil and gas processing industry, if there is an increase in PMDN by 1 percent, it will increase the GDP of the non-oil and gas processing industry by 0.08 percent. The coefficient value (β_3) 0.13 means that the inflation variable has a positive effect on the GDP of the non-oil and gas processing industry, if there is an increase in inflation of 1 percent it will increase the GDP of the non-oil and gas processing industry by 0.13 percent.

Based on Table 6. the results of the t test, statistically the variables of Foreign Investment,

Domestic Investment and Inflation have a significant effect on the GDP variable. The adjusted R-squared value is 0.9227 which means that 92.27 percent of the PMA, PMDN and inflation variables can explain variations in the GDP of the non-oil and gas processing industry.

CONCLUSION

The COVID-19 pandemic has had a significant impact on Indonesia's non-oil and gas processing industry sector. The growth of all non-oil and gas processing industries in 2020 decreased, except for the chemical, pharmaceutical and traditional medicine industries. The deepest contraction occurred in the transportation equipment industry by -19.86 percent which can be attributed to the decline in the use of transportation modes in line with the "lockdown and Large-Scale Social Restrictions, as well as decreased activity in other economic sectors.

There was an increase in the realization of PMA for the non-oil and gas processing industry in 2020 by 33.76 percent, with the largest increase occurring in the chemical, pharmaceutical and traditional medicine industries by 79.34 percent and the metal goods, computer, electronic, optical, and electrical equipment industries by 76.22 percent. However, there was an increase in foreign investment in the food and beverage sub-sector in Q3-2021, indicating that domestic and global demand is starting to recover. There was a decrease in the realization of PMDN in 2020 by 39.68 percent with the largest decline coming from the food and beverage industry by 37.6 percent. Multiple regression of panel data, Chow's test and Hausman's test chose the Fixed Effect Model as the best model to explain the effect of FDI, PMDN and Inflation, on the GDP of the Indonesian manufacturing sector. PMA, PMDN and Inflation have a significant effect on the GDP of the Indonesian manufacturing sector. It can be interpreted that the continuity and growth of the manufacturing sector in the first years (2020-2021) of the Pandemic in Indonesia was influenced by the high value of FDI, PMDN and controlled inflation with the monetary policy implemented by Bank Indonesia.

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