



THE EFFECT OF COVID-19 ON TEXTILE AND APPAREL INDUSTRIES IN INDONESIA

Sari^{1*}, Bambang Eko Afiatno²

^{1,2} Universitas Airlangga

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ABSTRACT

The Covid-19 pandemic has disrupted all sectors of life, including the economy. One of the the sectors most negatively affected by the Covid-19 pandemic in Indonesia is textile and apparel industry. This study investigates Indonesian textile and apparel export volumes, exchange rate of rupiah to us dollar and covid-19 as a dummy variable on the export performance of textile and apparel industry. This study used data from Statistics Indonesia, the World Trade Organization and the Federal Reserve Bank for January 2019 to December 2020 and analyzed by using time series forecasting with multiple linear regression. The export performance of textiles and apparel is proxied by total export of Indonesian textiles and apparel. The result of this study indicates that performance of Indonesian textile and apparel exports during the covid-19 outbreak in Indonesia decreased by 11.04% compared to normal conditions. Instead of being affected by the pandemic in the country, the pandemic that occurred in export destination countries could also reduce the value of Indonesia's textile and apparel exports, with the highest declines occurring in the USA (23.85%). Government can start by reducing the requirements for export destinations to America to recover the value of textile and apparel exports. In addition, the government can also reduce the burden on textile and apparel companies during the pandemic.

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Author correspondence:

E-mail: sari.ind18@gmail.com

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INTRODUCTION

Indonesia carries out trading activities in form of export and import, consisting of oil and gas and non-oil and gas sectors to various countries in the world. Indonesia's non-oil and gas are the leading exports sector in economy. This sector contributes greatly to national growth. Disturbance in the exports and imports products during covid-19 outbreak between countries, indirectly will be disturbance the national economy.

The non-oil and gas sector includes the textile and apparel industry. As one of the largest textile producers and exporters in the world, the Indonesian textile and apparel industry is expected to be able to improve its quality and adapt to industrial developments (4.0). Although industrial development and technological progress in textile industry also have negative impact to disruption the environmental and social welfare (Ozek:2017).

Export performance in developing countries influenced by several factors, including the appreciation (exchange rate) which has a negative impact on exports because it can reduce the profitability of exporters. Second, Capital formation on export performance which has a positive relationship. Third, The Multi Fiber Pre-Agreement (MFA) provides benefits to large industries while medium and small companies are more vulnerable because they face intense competition. Furthermore, the cost of labor, raw materials, and the technology used also has an important role in increasing exports of the textile industry.

In addition, non-tariff barriers from developed countries also have an influence on industrial exports in developing countries (Kumar & Phil, 2017). In term of Indonesia's, the factors can affect textile exports include the global crisis, exchange rates and textile prices (Setianto, 2014). It related by the results research from Ningsih, K & Setiawina (2020) which also states that the competitiveness of

the Indonesian exchange rate in the free market has significantly positive effect on the competitiveness of textile exports to Laos.

Export performance in most of countries is relatively more sensitive to domestic factors, especially the ability to compete in the world market (competitiveness), thus the policies designed to improve domestic supply conditions are urgently needed (Saputra, 2006). The importance of maintaining a strong domestic supply for more textile and apparel exports is also mentioned on the results research from Lee Juyoung, et al (2014) that said the domestic apparel supply and potential demand (an index that combines incoming demand between importing countries and the distance between countries in trade) is significant on apparel exports in developed countries.

Bangladesh as the world's second-biggest apparel exporter, faces great challenges for its textile industry because their country does not produce many raw materials, thus the textile industry is highly dependent on imports (Islam, 2013). A similar problem is also experienced in Indonesia, considering that Indonesia's textile production is influenced by world cotton prices and changes in labor on the textile industry which have negative relationship (hermawan, 2012). Over the last 20 years, Indonesia's production and area of cotton fiber continues to decline, while exports textile commodities continue to increase. This has resulted in a high demand for cotton fiber imports in Indonesia (Kartiasih & Hanifah, 2018).

The high import of cotton fiber is one of the internal problems in the competitiveness of exports, as stated by Kurniadi (2017 in Ragimun, 2018) that the competitiveness is divided into two, namely internal and external problems. In terms of raw materials and auxiliary materials, technology, human resources and working capital, as well as energy are including

internal problems. While external issues are including transportation, ports, taxation, domestic and global macroeconomics.

Based on previous research, there were no studies to find relationship between Covid-19 outbreak and Indonesia's textile and apparel export performance. In fact, according to data which released by Central Bureau of Statistics (Indonesia) in October 2020, the commodity sharps decline occurred in January-October 2020 (when the pandemic) was the apparel industry (convection) from textiles.

To fill the research gap, this study analyzes covid-19 outbreak and covid-19's cases in Indonesia's industrial export destination countries to the Indonesia's textile and apparel Industry performance. This study also aims to find the competitiveness of Indonesian textile exports over the last 5 years that has not yet been explored.

METHODOLOGY

This study uses a quantitative approach. The data used are total number of Indonesian and world textile and apparel exports, the total number of Indonesian and world exports, the rupiah exchange rate against the dollar, the volume of Indonesian textile and apparel exports and data on the development of COVID-19 cases in Indonesia's five largest industrial export destinations. (China, Japan, USA, Singapore and India). The competitiveness of Indonesia's textile export performance is calculated by comparing the export value of textiles and apparel to the total number of exports that occurred in Indonesia and the world through the calculation of RCA (Revealed Comparative Advantage) with the following formula:

$$RCA = \frac{(X_{ia}) / (total X_a)}{(X_{iw}) / (total X_w)} \dots\dots\dots 1)$$

Information:

X = Export value of Textiles and Apparel

i = Type of commodity (Textile and Apparel Industry)

a = Country of origin (Indonesia)

w= World (world)

RCA < 1 or close to 0 means that the competitiveness of the textile and apparel industry is weak, while the RCA value > 1 means that the competitiveness can be said to be strong. The higher the RCA value of a commodity, the stronger its competitiveness. The impact of covid-19 outbreak on the performance of Indonesian textile exports, data will be analyzed using the multiple linear regression method using Stata. A regression model with more than one explanatory variable is known as a multiple regression model, multiple because multiple influences (i.e., variables) may effect the dependent variable. Before performing regression analysis, the classical assumption test is carried out first. The classical assumption test was conducted to ensure that the research results are valid with the data used (Gujarati, 2011).

Classical assumption testing to detect normality problems used the Jarque-Bera test or J-B test, multicollinearity used tolerance (TOL) and variance-inflating factor (VIF). Futhermore to detect heteroscedasticity and autocorrelation, the Breusch-Pagan-Godfrey test parameters are used.

Determination of the t-statistic test is carried out by comparing the p-value (probability value of each variable) to the level of significance used ($\alpha = 5\%$). Meanwhile, the F-Statistic test was carried out in this study to find out whether all the independent variables affect the variables together. If the p-value < α , H0 is rejected and H1 is accepted, which means that the independent variable significantly affects the dependent variable.

Model used to analyze the impact of covid-19 outbreak on the performance of Indonesian textile exports shows below:

$$\ln EXPTPT_t = a + b_1 \ln VEXTPT_t + b_2 \ln EXC_t + b_3 \text{COVID19} + \epsilon_t \dots \dots \dots 2)$$

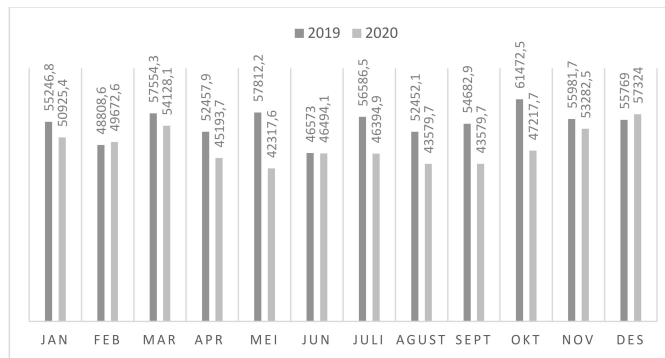
COVID-19 : Dummy variable
 ϵ_t : Error term

+ $b_3 \text{ COVID19} + \epsilon_t \dots \dots \dots 2)$
 Information:
 $\ln EXPTPT_t$: The value of Indonesian textile and apparel exports in t month
 a : Constant value
 b : Regression coefficient value
 $\ln VEXTPT_t$: Textile and Apparel export volume in t month
 $\ln EXC_t$: Rupiah exchange rate to dolar

Result and Discussion
Descriptive Analysis

1) Development of National Export Volume

In Figure 1. The volume of national exports in 2020 tends to decrease compared to 2019. The highest contraction occurred in May 2020. It caused by decreasing in exports to Indonesia's industrial export destinations due to the pandemic.



Source: World Health Organization (2020)

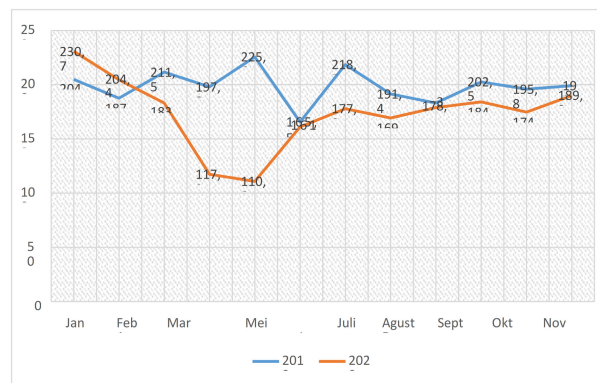
Figure 1.

Development of National Export Volume

2) Development of Textile Export Volume

The volume of textile exports has decreased since January-May 2020. This

decline could occur as a result of low domestic and global demand for textile and textile products as shown in Figure 2.



Source: Central Bureau Statistics (2020)

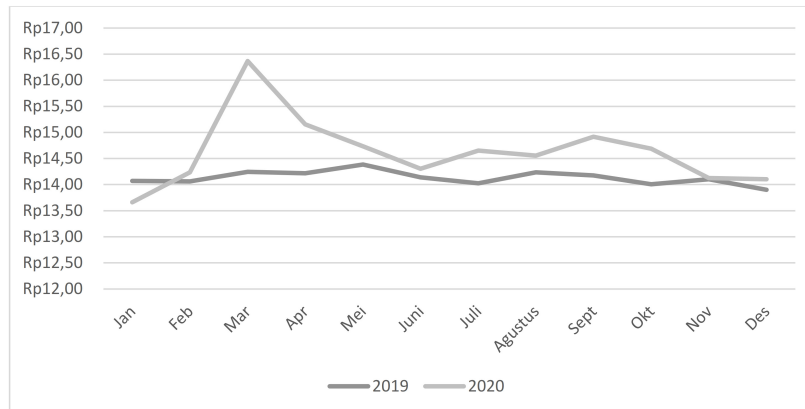
Figure 2.

Development of Textile Export Volume

3) Development of Exchange Rate from Rupiah to Dollar

Based on Figure 3. the condition of exchange rate from rupiah to dollar in 2019 looks quite stable and even strengthened at the end of the year (Rp 13,662).

The Rupiah weakened and even touched Dollar in March 2020. It caused by covid-19 outbreak that occurred in everypart of the world, thus effect panic in the global market situations.



Source: Federal Reserve Bank of St. Louis (2020)

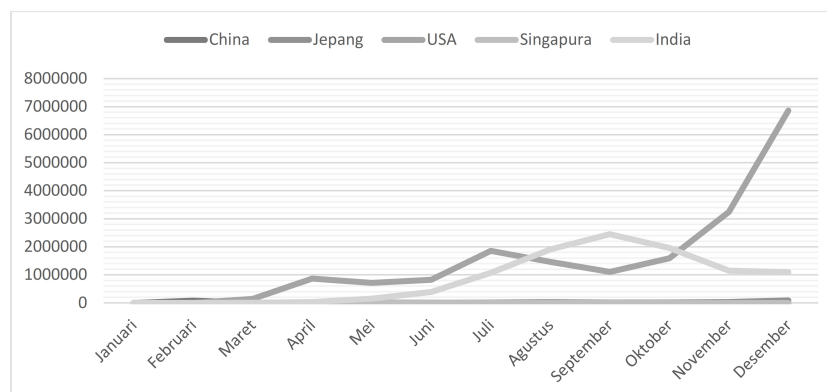
Figure 3.

Development of Exchange Rate from Rupiah to Dollar

4) Development of Covid-19 cases in 5 destination countries for Indonesian industrial exports

Based on Figure 4, since January 2020, of the 5 industrial export destinations in Indonesia, the highest COVID-19 cases

have occurred in the USA, followed by India, Japan, Singapore and China. Although China was the first country to report COVID-19 cases to the WHO in January 2020, China was able to control increasing Covid-19 cases in its country.



Source: World Health Organization (2020)

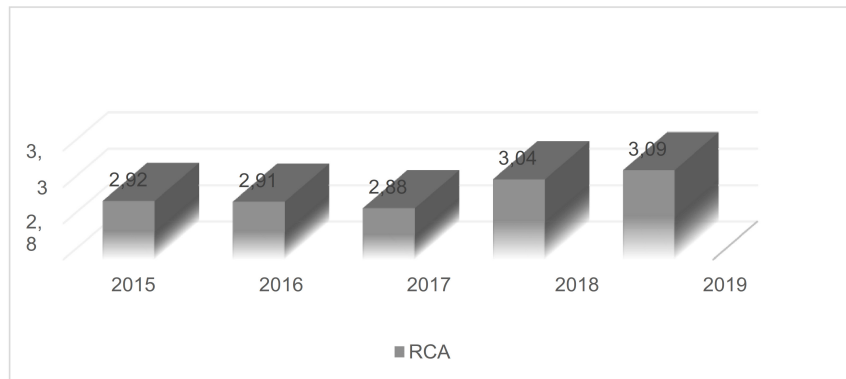
Figure 4.

Development of Covid-19 Cases in Five Countries

5) Development of Indonesian Textile and Apparel Export Competitiveness

Based on the RCA in Figure 5. Indonesia's textile and apparel export competitiveness in 2015-2019 has fluctuated, the highest value occurred in 2019. Although the export value of Indonesian textiles and apparel in

2019 decreased compared to 2018 but the decline in global exports in 2019 is the reason why the competitiveness of Indonesian textile and apparel exports still stable. Although there is no significant increase compared to the previous year.



Source: Authors (2020)

Figure 5.
RCA Result

Indonesia's textile and apparel export performance is significantly affected by the total volume of textile and apparel exports

and Covid-19 Outbreak that shown in these tables below:

Table 1.
Results of Covid-19 Regression on Indonesia's Textile Export Performance

Variable	Coefficient (Error Std)	t	p>t
Lnvextpt	0.7783413 (0.1101203)	7.07	0.000
Lnexc	0.8315185 (0.5260058)	1.58	0.130
Dumindo	-0.1104329 (0.0431921)	-2.56	0.019
_cons	-5.097706 (5.120849)	-1.00	0.331
R-squared	0.8522		
Prob>F	0.0000		

Source : Estimation result run by stata, 2022

Based on table 1. the export volume of textiles and apparel obtained t-statistic of 7.07 with a significance value of 0.000 or < level of significant (1% or 0.01), therefore

it can be stated that the hypothesis in this study which states that the volume of textile and apparel exports has an influence on export value of textiles and apparel can be

approved.

The coefficient value of 0.7783413 indicates that the value of Indonesian textile and apparel exports will increase by 77.83% if there is 1% augment in the national textile and apparel export volume. Given the importance of export volume on export performance, this finding supported the results research from Lee, Juyoung., Karpova. E., & Lee, M. (2014) which said the necessary to maintain a strong domestic quantity/supply so that the export volume is not disrupted and the export value can be higher.

The exchange rate variable shows t-statistic of 1.58 with a significance value of 0.130 or > 0.05 therefore the hypothesis that the exchange rate variable affects the export value of Indonesian textiles and apparel cannot be fulfilled. The strengthening of the rupiah exchange rate did not cause decreasing in the value of Indonesian textile and apparel exports which was confirmed by the positive results of the rupiah exchange rate to the dollar. This finding is different from the results of the study of Kumar, Senthil., & Phil. M. (2017) that said the appreciation of exchange rate has a negative impact on exports because it can reduce the profitability of exporters.

The contradiction results are thought to be due to the high import of raw materials for Indonesian textile and finished products (Ragimun: 2018). Therefore, when the rupiah strengthens (appreciation) the price of textile and apparel products will decrease because the price of imported raw materials will be cheaper and production costs will decrease, thus

the value of Indonesian textile and apparel exports continues to increase.

Dummy variable for covid 19 outbreak obtained t-statistic result of -2.56 0.019 with a significance value of 0.019 or $<$ level of significant 5% or 0.05 thus it can be stated that the hypothesis in this study which states that covid-19 outbreak affects the export value of textiles and apparel can be fulfilled. The coefficient value of -0.1104329 indicates when the covid 19 outbreak occurs in Indonesia, the export value of Indonesian textiles and apparel will decrease by 11.04%.

Based on the probability value in the F test of 0.0000 or < 0.05 , it can be concluded that all variables including of textile and apparel export volume, exchange rate and covid-19 outbreak have significantly affect the value of Indonesian textile and apparel performance. The coefficient of determination (R^2) is 0.8522 or 85.22%, meaning that export volume of textiles and apparel, exchange rate and covid-19 outbreak affect the export value of Indonesian textiles and apparel, which can be explained by the model of 85.22% while the rest is determined outside the model.

Based on the results of the classical assumption test, it is known that the data used in the model does not have autocorrelation problems because the Breusch-Godfrey test shows a value of 0.7979 or > 0.05 . In addition, the data also does not have multicollinearity problems because the mean of VIF value is 1.80 or < 10 . Furthermore, data is homoscedasticity because the p-value obtained from the Breusch-Pagan test also shown a value of 0.6536 or > 0.05 .

Table 2.
America's Destination of Textiles and Apparel Exports

Variable	Coefficient (Error Std)	t	p>t
Invextptus	0.8205177 0.1422901	5.77	0.000
Dumus	-0.2385339 0.0368114	-6.48	0.000
_cons	0.9809201 1.038926	0.94	0.356
R-squared	0.7605		
Prob>F	0.0000		

Source : Estimation result run by stata, 2022

Based on Table 2, the probability value of the F test is 0.0000 or <0.05, it can be concluded that the independent variables, namely the volume of textile and apparel exports to America and the covid-19 outbreak in America in common, affected the value of Indonesian textile and apparel exports (dependent variable). The coefficient of determination (R2) is 0.7605 or 76.05%, it means that the volume of textile and apparel exports to America and the covid-19 outbreak that occurred in America affected the value of Indonesian textile and apparel exports, which can be explained by the model at 76.05% and the rest described outside the model.

The value of the volume of textile and apparel exports to America is partially significant at the 5% level with t statistic is 5.77 and a significance value is 0.000 or < level of significant 1% or 0.01. Therefore, the hypothesis in this study which states

that the Covid-19 outbreak that occurred in the export destination country of Indonesian Industry (America) has an influence on the value of Indonesian textile and apparel exports can be fulfilled. The coefficient value of 0.8205177 indicates that when 1% augment in the volume of textile and apparel exports to America, it can increase the export value of Indonesian textiles and apparel by 82.05%. The Covid-19 outbreak obtained t-statistic result of -6.48 with a significance value of 0.000 or < level of significant 1% or 0.01. Thus, it can be stated that the hypothesis in this study which states that the covid-19 outbreak affects the export value of textiles and apparel can be fulfilled. The coefficient value of -0.2385339 indicates that covid-19 outbreak occurred in America, it could reduce the value of Indonesian textile and apparel exports by 23.85%

Table 3.
China's Destination of Textiles and Apparel Exports

Variable	Coefficient (Error Std)	t	p>t
InvextptChina	-0.0604792 (0.188324)	-0.32	0.751
Dumchin	-0.1849661 (0.065642)	-2.82	0.010
_cons	7.437923 1.458333	5.10	0.000
R-squared	0.3232		
Prob>F	0.0166		

Source : Estimation result run by stata, 2022

Based on table 3, the F test results obtained 0.0166 or <0.05, it can be concluded that the volume of textile and apparel exports to China and the covid-19 outbreak in China simultaneously affect the value of Indonesian textile and apparel exports. The coefficient of determination (R²) is 0.3232 or 32.32%, it means that volume of textile and apparel exports to China and the covid-19 outbreak that occurred in China affected the export value of Indonesian textiles and apparel, which can be explained by the model of 32.32% and the rest is explained outside the model.

The value of the export volume of textiles and apparel to China obtained t statistic is -0.32 with a significance value of 0.751 or > level of significant 5% or 0.05. Hence, the hypothesis in that study which

states the volume of exports on textiles and apparel to China affects the value of exports. Indonesia's textile and apparel exports could not be fulfilled.

The dummy variable for covid-19 outbreak obtained t-statistic result of -2.82 with a significance value of 0.010 or < level of significant 1% or 0.01, thus it can be stated that the hypothesis in this study which states that the covid-19 outbreak that occurred in the destination country for Indonesian industrial exports to China can affect the value of Indonesian textile and apparel exports can be fulfilled. The coefficient value of -0.1849661 indicates that when t covid-19 outbreak occurred in China, it could reduce the export value of Indonesian textiles and apparel by 18.49%

Tabel 4.
Japan's Destination of Textiles and Apparel Exports

Variable	Coefficient (Error Std)	t	p>t
InvextptJep	1.046646 (0.2437706)	4.29	0.000
Dumjep	-.0265142 (0.059142)	-0.45	0.659
_cons	-.5555726 (1.752992)	-0.32	0.754
R-squared	0.6378		
Prob>F	0.0000		

Source : Estimation result run by stata, 2022

Based on table 4, the F test results obtained 0.0000 or <0.05, it can be concluded that the volume of textile and apparel exports to Japan and the covid-19 outbreak in Japan simultaneously affect the export value of Indonesian textiles and apparel. The coefficient of determination (R²) of 0.6378 or 63.78%, it means that the volume of textile and apparel exports to Japan and the covid-19 outbreak that occurred in Japan can affect the value of Indonesian textile and apparel exports, which can be explained by the model of 63.78% and the rest is explained outside

the model.

The value of the exports volume on textile and apparel to Japan obtained a t-statistic result of 4.29 with a significance value of 0.000 or < level of significant 1% or 0.01, thus the hypothesis in the study which states that the volume of textile and apparel exports to Japan affects the export value of export values. Indonesian textiles and apparel can be fulfilled. The coefficient value of 1.046646 indicates that when there is 1% an augment in the volume of textile and apparel exports to Japan, the value of Indonesian textile and apparel

exports increases by 104.66%.

Covid-19 outbreak obtained t-statistic result of -0.45 with a significance value of 0.659 or > 5% or 0.05 level of significance, thus the hypothesis in the study which states that the covid-19

pandemic that occurred in the destination country for Indonesian industrial exports to Japan could affect the value of textile exports. and Indonesian apparel, cannot be fulfilled

Table 5.
Singapore's Destination of Textiles and Apparel Exports

Variable	Coefficient (Error Std)	t	p>t
InvextptSing	0.6136216 (0.1071217)	5.73	0.000
dumsing	-0.0725561 (0.0439056)	-1.65	0.113
_cons	2.685039 (0.7484854)	3.59	0.002
R-squared	0.7585		
Prob>F	0.0000		

Source : Estimation result run by stata, 2022

In Table 5, the F test results obtained 0.0000 or < 0.05, it can be concluded that the volume of textile and apparel exports to Singapore and the covid-19 outbreak in Singapore simultaneously can affect the value of Indonesian textile and apparel exports. The coefficient of determination (R2) of 0.7585 or 75.85% means that the volume of textile and apparel exports to Singapore and the covid-19 outbreak that occurred in Singapore can affect the value of Indonesian textile and apparel exports, which can be explained by the model of 75.85% and the rest is explained outside the model.

The value of the volume of textile and apparel exports to Singapore obtained t-statistic result of 5.73 with a significance value of 0.000 or < level of significant 1% or 0.01, thus the hypothesis in the study which states that the volume of textile and In Table 6, the probability value of the F test obtained is 0.0000 or <0.05, it can be concluded that together the volume of textile and apparel exports to India and the covid-19 outbreak in India simultaneously

affect the export value of Indonesian textiles and apparel. The coefficient of determination (R2) of 0.6846 or 68.46% means that the volume of textile and apparel exports to India and the covid-19 outbreak that occurred in India can affect the value of Indonesian textile and apparel apparel exports to Singapore affects the export value of export values. Indonesian textiles and apparel can be fullified. The coefficient value of 0.6136216 indicates that when there is 1% an augment in the volume of textile and apparel exports to Singapore, it can increase the export value of Indonesian textiles and apparel by 61.36%.

The dummy variable for the covid-19 outbreak in Singapore, obtained t-statistic result of -1.65 with a significance value of 0.113 or > level of significant 5% or 0.05 so that the hypothesis in the study which states that the covid-19 pandemic that occurred in the destination country for Indonesian industrial exports to Singapore can affect the value of Indonesian textile and apparel exports, cannot be fullified..

Table 6.
India's Destination of Textiles and Apparel Exports

Variable	Coefficient (Error Std)	t	p>t
InvextptIndia	0.4743151 (0.1055544)	4.49	0.000
Dumindia	-0.1254823 (0.0460144)	-2.73	0.013
_con	3.701603 (0.727949)	5.08	0.000
R-squared	0.6846		
Prob>F	0.0000		

Source : Estimation result run by stata, 2022

In Table 6, the probability value of the F test obtained is 0.0000 or <0.05 , it can be concluded that together the volume of textile and apparel exports to India and the covid-19 outbreak in India simultaneously affect the export value of Indonesian textiles and apparel. The coefficient of determination (R^2) of 0.6846 or 68.46% means that the volume of textile and apparel exports to India and the covid-19 outbreak that occurred in India can affect the value of Indonesian textile and apparel exports, which can be explained by the model of 68.48% and the rest is explained outside the model.

The value of the volume of textile and apparel exports to India is partially significant at the 5% level with t statistic of 4.49 and a significance value of 0.000 or $<$ level of significant 1% or 0.01. Therefore, the hypothesis in the study which states that the covid-19 outbreak that occurred in the export destination country of Indonesian Industry (India) has an influence on the value of Indonesian textile and apparel exports can be fulfilled. The coefficient value of 0.4743151 indicates that when there is an augment 1% in the volume of textile and apparel exports to India, it can increase the value of Indonesian textile and apparel exports by 47.43%.

CONCLUSION

The competitiveness of Indonesian textile and apparel commodities is still quite strong to the global market in 2015-2019. Nevertheless, the government must still encourage the improvement of Indonesian textile and apparel competitiveness products while pandemic, for example by supporting the development of distinctive product designs, hence the output produced is high quality and different from other countries. Furthermore, the export performance of textiles and apparel in Indonesia, instead of influenced by the volume of textiles and apparel exports, it also affected by the covid-19 outbreak that occurred in domestic and in export destination countries such as America, China and India.

The performance of Indonesian textile and apparel exports during the covid-19 outbreak in Indonesia decreased by 11.04% compared to normal conditions. Instead of being affected by the pandemic in the country, the pandemic that occurred in export destination countries could also reduce the value of Indonesia's textile and apparel exports, with the highest declines occurring in the USA (23.85%), China (18.49%), India (12.54%), Singapore (7.25%), and Japan (2.65%).

The highest decline that occurred in America was due to the largest number of Indonesian textile and apparel exports since 2012-2019 was to America (Central Bureau of Statistics). Therefore, the pandemic in America greatly affects the performance of domestic textile and apparel exports in Indonesia. Hence, to recover the value of textile and apparel exports, the government can start by reducing the requirements for export destinations to America. In addition, the government can also reduce the burden on textile and apparel companies during the pandemic through cutting electricity rates, reducing taxes, and reducing labor subsidies so that the textile and apparel industry can survive.

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