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AN ANALYSIS OF FACTORS AFFECTING MANUFACTURING EXPORTS IN INDONESIA

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ABSTRACT

The growth of manufacturing exports from 2010 through 2019 continued to decline. This condition might be due to internal and external factors. Internal determinants include inflation, the exchange rate for Indonesian rupiah, and the gross domestic product (GDP). In addition, the influx of foreign direct investment (FDI) into the manufacturing sector can be assumed to be a factor influencing the development of manufacturing exports because of its contribution in terms of technology and managerial transfer and the labor turning-point. This research aims to establish factors affecting Indonesia's manufacturing exports. These factors are inflation, exchange rates, GDP, and FDI. The research tool used in this study is the vector error correction model (VECM). A total of 40 data observed in this study are collected from 2010-Q1 to 2019-Q4. The findings revealed that the influences of inflation and FDI in lag 1 had a damaging effect on manufacturing exports in the short and long periods of time. In comparison, in a brief period, the GDP in Lag 1 and Lag 2 has a positive impact, even in the long period, GDP in Lag 1 has a positive influence. Meanwhile, the exchange rate factor has little influence on manufacturing exports, either in the short and long periods of time.
Keywords: Export, Inflation, Exchange Rate, FDI, VECM

ABSTRAK

Pertumbuhan ekspor manufaktur selama periode 2010-2019 terus mengalami penurunan. Hal tersebut dapat disebabkan oleh factor internal maupun factor eksternal. Faktor internal diantaranya adalah factor inflasi, kurs rupiah dan PDB. Selain itu factor masuknya investasi asing seperti Foreign Direct Investment (FDI) di sector manufaktur dapat diduga sebagai factor yang mempengaruhi perkembangan ekspor manufaktur karena kontribusinya dalam hal transfer teknologi dan manajerial serta penyerapan tenaga kerja. Penelitian ini bertujuan untuk mengetahui factor-faktor yang mempengaruhi ekspor manufaktur di Indonesia. Faktor-faktor tersebut adalah factor inflasi, kurs, PDB dan FDI. Metode analisis data yang digunakan dalam penelitian ini adalah vector error correction model (VECM). Adapun total pengamatan data dalam penelitian ini sebanyak 40 buah mulai dari 2010 Q1 sampai dengan 2019 Q4. Hasil penelitian menunjukkan bahwa faktor inflasi dan FDI pada lag 1 berpengaruh negative terhadap ekspor manufaktur baik dalam jangka pendek maupun jangka panjang. Sedangkan factor PDB pada lag 1 dan lag 2 berpengaruh positif dalam jangka pendek dan PDB pada lag 1 berpengaruh positif dalam jangka panjang. Sementara itu factor kurs tidak berpengaruh terhadap ekspor manufaktur baik dalam jangka pendek maupun jangka panjang.
Kata Kunci: Ekspor, Inflasi, kurs, FDI, VECM

1. INTRODUCTION

The global economy is growing at a slower pace, followed by a slowing volume of world trade and falling commodity prices

have an impact on Indonesia's slower export performance. Falling commodity prices have lowered Indonesia's terms of trade (TOT) and weakened export performance, wherein 2018, export performance only grew by 7.01%, down from 16.9% in 2017. On the other hand, the increase in domestic demand pushed up imports. This condition caused the current account deficit in 2018 to widen to USD 30,484 million, higher than the current account deficit in 2017, which was USD 16,196 million (Bank Indonesia, 2019).

During the period of 2010-2018, the value of Indonesia's exports continued to decline. This problem has attracted the Indonesian government's attention to resolve it immediately by increasing the total export performance. Secretary-General of the Ministry of Industry, Haris Munandar, said that the government is currently focused on increasing the value of exports to overcome the trade balance deficit. One sector that could be improved is the manufacturing sector. These efforts are also in line with the target of making Indonesia 4.0, wherein 2030, the net export figure will return up to 10 percent. There are five industrial sectors whose development is prioritized to enter the era of industrial revolution 4.0 and be encouraged to export actively. The five industries comprise the food and beverage business, the garment and apparel business, the automobile business, the chemical business, and the electronics business. (Indonesian Ministry of Industry, 2018).

From 2011 to 2019, the average growth of manufacturing exports tended to decline. In 2017-2018, it decreased sharply from 14.50% in 2017 to 3.84% in 2018. Even in 2019, it reached negative 3.01%. However, when viewed from the contribution to total exports, the manufacturing sector contributed the highest to the achievement of national export value compared to other sectors, namely 73.02% in 2019, followed by exports of mining products by 20.28%, exports of agricultural products by 3.46%, and other merchandise by 1.13%. The manufacturing industry is also the industry that significantly contributes to the added value of national output which in 2019 reached 20.79% by the wholesale and retail trade sector, car and motorcycle repair sector 13.16%, and agriculture, forestry, and fisheries sector 12.37% (Bank Indonesia, 2020). Likewise, its contribution to labor turning-point continued to increase during the 2015-2018 period. In 2015, the manufacturing industry created employment for 15.54 million people and the number increased in 2016 to 15.97 million people. In 2017, the manufacturing sector employed up to 17.56 million people and significantly increased in 2018 to 18.25 million people. During four years (2015-2018), there was an increase of 17.4 percent in labor turning-point.

According to the Minister of Industry, Airlangga Hartarto, in an effort to encourage export growth from the manufacturing industry, there are actions needed to spur investment or expansion to boost industrial capacity, namely additional investment for business expansion. Until December 2018, investment in the non-oil and gas industry is estimated to reach IDR 226.18 trillion. In addition to growing the industrial population, the additional investment can deepen the domestic industrial structure so that it acts as import substitution (medianasional.id, 2018).

Given the significance of the central role of exports, in particular exports of the manufacturing sector to the economy of Indonesia, it is essential to recognize factors that are considered to have an effect on the output of Indonesia's manufacturing exports. Previous research on the influential factors of export success show that exports are driven by supply-side factors, for example domestic prices (established by government or market), gross domestic product (GDP) rise, adaptable cost indexes, and capacity utilization. Fewer investigations also focused on determining factors of export demand, such as wages and costs in the competing markets. The disparity in

literature seems to have occurred because developing countries are generally considered to be unable to accommodate the fluid demand for their goods, although fluctuations in international demand will only impact goods through shifts in world prices.

The rise in the export value of the manufacturing sector is mostly attributed to imports, inflation, economic growth, foreign direct investment (FDI), exchange rates, labor force, industrialization, the distance between two countries and tariffs. FDI has a beneficial impact on exports, as observed by Jongwanich (2010), Malhotra and Kumari (2015), Oo et al. (2019), and Özgur Uysal and Abdulakadir Said Mohamoud (2018), although the findings of another analysis by Sharma (2003) indicate that FDI does not influence exports. However, the inflation does impact exports negatively, as reported in the study by Özgur Uysal and Abdulakadir Said Mohamoud (2018), but it is not influential to exports according to the findings of the research by Bakar et al. (2015).

Furthermore, the exchange rate is also a factor that has been widely studied as a factor that influences exports positively as researched by Abidin et al.(2013), Bakar et al. (2015), Haseeb et al. (2014), Malhotra and Kumari (2015), Nguyen (2010), Özgur Uysal and Abdulakadir Said Mohamoud (2018), Sharma (2003), and Tumwebaze Karamuriro (2015). Meanwhile, the results of a study by Alam et al. (2017), which is a sectoral analysis, found that the currency convertibility rate affected exports positively while some cases affected exports negatively. The sectors studied are exports of the food industry, textiles, other manufacturing industries, and exports of other sectors. Likewise, a study conducted by Hall et al. (2010) finds there is a detrimental effect of currency fluctuations on exports. GDP is a variable known to be able to affect export success as analyzed by Abidin et al. (2013), Bakar et al. (2015), Haseeb et al. (2014), Nguyen (2010), Oo et al. (2019), and Tumwebaze Karamuriro (2015) suggest, stating that GDP has a strong beneficial impact on exports. Meanwhile, the growth of GDP, according to the findings of Özgur Uysal and Abdulakadir Said Mohamoud (2018), is not influential to the value of exports.

Based on the findings of the previous studies, it is necessary to analyze the determinants of export activity in Indonesia with the vector error correction model (VECM) analysis. Moreover, the purpose of this analysis is to identify the impact of particular factors on Indonesia's manufacturing exports in the 2010-Q1 to 2019-Q4 period. Some of the main factors that can affect manufacturing exports include the rupiah's rate of exchange, inflation, FDI, and GDP.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Many previous researchers have conducted research related to the factors that influence exports. One of the research is by Özgur Uysal and Abdulakadir Said Mohamoud (2018), which analyzes the affecting factors of export performance in seven countries in East Africa during 1990-2014. The analysis technique used is panel data regression. The estimation results suggest that the labor force, industrialization, FDI, and rate of exchange positively impact the export value. Meanwhile, inflation negatively impacts export performance. On the other hand, GDP growth is a variable that does not affect East African countries' export value.

Other researchers, Abidin et al. (2013), conducted a study on the factors affecting Malaysian exports to countries which are members of the Organization of Islamic Cooperation (OIC) between 1997 and 2009 using a gravity model approach and data analysis techniques using panel data regression. The findings show that the size and level of economic openness, inflation rate, and the exchange rate had significantly affected Malaysian exports to OIC countries.

Furthermore, Bakar et al. (2015) have

identified the effect of macroeconomic factors such as GDP, inflation or consumers price index (CPI), trade contribution in the GDP (TRGDP), and the exchange rate (ER) on the export activity in Malaysia and other OIC member countries in 1997-2012. This study applies Fully Modify OLS, which investigates long-term relationships using panel data regression techniques (panel unit root test and panel cointegration test), and short-term relationships with an error correction model (ECM) panel. The results show that over a long time, GDP, TRGDP, and the exchange rate positively affect Malaysian export activity to OIC countries. Meanwhile, in a brief period, only TRGDP and ER variables have a positive effect.

Moreover, Alam et al. (2017) have analyzed the exchange rate volatility in the Pakistani sectoral exports with its main trading associates, namely the United States, the United Kingdom, Japan, Germany, and Saudi Arabia. The data analysis technique adopts the multivariate co-integration test or Vector Autoregression (VAR) approach. The findings indicate a long-term connection between the exchange rate volatility and sectoral exports, and that exchange rate volatility owns a consistent and beneficial influence on Pakistan's sector specific exports.

Research has also been conducted by Jongwanich (2010) who analyzed the determinant factors of exports in eight East Asian and Southeast Asian countries during 1993-2008. This study defines three types of export: maximum exports of merchandise, manufacturing exports, and exports of machinery and transport equipment. The data is investigated using general-to-specific modeling (GSM) by testing cointegration (long-term relationship). The results suggest that the use of components in production tends to weaken the relationship between the real exchange rate and export results. World demand and supply-side variables, like FDI, appear to be more important when assessing export results.

The next researchers are Oo et al. (2019), whose research is titled *Determinants of Export Performance in the ASEAN region*, covering the 2000-2015 period. This research uses the Autoregressive Distributed Lag (ARDL) panel data analysis. The results suggest that there is a long-term association between export factors, such as interest rates, economic growth, and FDI with the export success of ASEAN countries.

The study conducted by Nguyen (2010) on the determinant factors of Vietnam's export movements using a static and dynamic panel gravity approach show that income, transportation costs, exchange rates, and ASEAN membership of trading partners significantly affect Vietnam's export success.

Meanwhile, Sharma (2003) has investigated the influential factors of export activity in India during 1970–1998. The research used simultaneous regression where there are two equations, namely the export demand equation and export supply. The findings show that the factors which influence export demand are the real effective exchange rate and the previous export value (lag export). On the other hand, world income does not affect export demand. Furthermore, the factors that influence export supply are the relative domestic price, which has a positive effect, the decline in domestic demand has a damaging effect, and then the export lag and the time trend also have a positive effect. Meanwhile, FDI and infrastructure investment do not affect export performance.

Havrila and Gunawardana (2006) have examined the determinants that control the export supply of the Australian textile industry during the 1970-1999 period. The results showed that, in a brief and long period, the export supply of textiles was positively influenced by the relative price of exports, and was negatively affected by the effectiveness of workers and the production capacity of textiles.

Meanwhile, Olofin (2018) has estimated the income elasticity and export prices

aimed at Sub-Saharan Africa. The analysis method used is panel data analysis consisting of 20 countries in Sub-Saharan Africa, from 1980 to 2003. The results reveal that the relative prices and trading partners' income are essential variables that determine the export success of Sub-Saharan Africa. The export performance of Sub-Saharan Africa is poor because African export demand has a weak elasticity in comparison to shifts in global income and is, in most instances, not sustainable on international markets. The projected long-term income elasticity ranges from 0.48 to 1.30, while the long-term price elasticity ranges from-0.01 to-0.17.

Malhotra and Kumari (2015) have examined the determinant factors of export performance in Asian economies during 1980-2012. The areas selected in this study consisted of three sub-regions, namely East Asia, Southeast Asia, and South Asia. East Asia includes China, Japan, and South Korea; Southeast Asia includes Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam; while South Asia includes Bangladesh, India, Pakistan, and Sri Lanka. By using aggregate annual data, the Ordinary Least Square (OLS) method to measure the effect of different variables on the export output of these Asian countries' economies. Several factors, namely global demand, real effective exchange rates, productive capacity, relative prices, FDI, and trade openness, affect export output.

Tumwebaze Karamuriro (2015) also investigated the determinant factors related to the export output of Uganda during the 1980-2012 period using gravity model analysis. The analysis method uses random effects and the generalized method of moment (GMM) model. The findings suggest that the Ugandan GDP, importers' GDP, importers' GDP per capita, disparities in GDP per capita among Uganda and their trading partners, real exchange rates, official languages, and distance all have positively and significantly affected Uganda's exports. Furthermore, the formation of the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) has been greatly impacted Uganda's exports. In comparison, Uganda's GDP per capita and the gap between Uganda and its trading partners have a detrimental influence on Uganda's export flows.

The research conducted by Cieślik et al. (2015) has examined the export essential factors of three Baltic countries and four Central European countries (CECs). This study covers Estonia, Latvia, Lithuania, Czech Republic, Hungary, Poland, and Slovakia for three years: 2002, 2005, and 2009. The estimation uses the probity regressions model by grouping countries into two groups. The Baltic and CEC countries' estimation results confirm that the export prospect is supportively correlated to the productivity level, the scale of the business, productive university graduates, as well as company internationalization.

In addition, Hall et al. (2010) have studied the effect of real exchange rate volatility on exports in ten Emerging Market Economies (EMEs) including eleven other countries under development that were not listed as EMEs during 1980-Q1 to 2006-Q4 for EMEs; also, in the 1980-Q1 to 2005-Q4 for other countries under development. This study uses panel data and two estimation methods, namely GMM and time-varying-coefficient (TVC). This estimate removes the specification bias from the coefficients. The results display the exchange rate volatility's undesirable and substantial effect on trade in non-EMEs countries, while it positively affects the EMEs countries. These results indicate that open capital markets for EMEs are believed to have decreased the impact of exchange rate volatility on exports in contrast to its impact on non-EMEs countries.

Given the explanation presented above, the following hypotheses are set out in this report. First, inflation negatively affect

Indonesian manufacturing exports in the short and long term. Second, FDI, GDP, and the exchange rate positively affect Indonesian manufacturing exports in the short and long term.

3. RESEARCH METHOD

This research employs quantitative methods. The data used in the research is time-series data from the 2010-Q1 through 2019-Q4 periods obtained from Bank Indonesia's Indonesian Financial Economic and Financial Statistics (SEKI). By referring to several variables from previous studies, to explore the influence of determinant factors of manufacturing exports in Indonesia, the specification of the research model has been determined that manufacturing exports (EXP_MAN) is a function of the inflation (INF), FDI, ER, and GDP or Expor_Man = f(INF, FDI, ER, PDB).

Furthermore, the data analysis technique used is the time-series VECM. The VECM method is employed to analyze the long-term and short-term connection between the independent and dependent variables in the time-series data. VECM is an estimated method of VAR. The restriction is given because the data is not stationary but cointegrated. Before running the VECM method, it is essential to examine the data stationarity, determine the optimum lag, and perform the cointegration test. If the data is not stationary but cointegrated, then it is followed by forming a VECM model to test its feasibility (Gujarati, 2004).

Stationarity Test

The data stationarity test uses the unit root test to verify if the data contains unit roots or not. When the variable has unit roots, then it is non-stationary. In addition, to determine the order of integration, the unit root test can be carried out to identify how many times the differentiation must be done so that the data becomes stationary. Several methods are used to carry out the unit root test, and among them, which is currently widely used, is Dickey-Fuller (DF) using the Eviews program version 10, according to the co-creators, namely David Dickey and Wayne Fuller. In practice, there are three forms of the Dickey-Fuller test equation as follows:

1. Model without intercept and trend
2. Model with intercept and without trend
3. Model with intercept and trend

The specification of equations used by Dickey-Fuller in equations without intercept and trend (random walk) can be defined in this manner:

$$\Delta Y_t = \lambda Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \text{.....(1)}$$

The equation with an intercept and without a trend (random walk with drift) is able to be defined in this manner:

$$\Delta Y_t = a_0 + \lambda Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \text{...(2)}$$

Furthermore, the equation with intercept and trend is:

$$\Delta Y_t = a_0 + \lambda Y_{t-1} + a_2 t + \sum_{i=2}^{p} \beta_i \Delta Y_{t-i+1} + \varepsilon_t \text{.....(3)}$$

The classic assumption criteria for obtaining the Best Linear Unisex Estimator (BLUE) regression results according to Ekananda (2018) is that the variables in the regression equation must be stationary and ε_t has a zero average and finite variance. The non-stationary variables' presence will result in a spurious regression characterized by high R_{square} value and significant t_{stat} value.

To conduct the analysis, the unit root test was used with the Augmented Dickey-Fuller (ADF) test procedure through the process for each variable in this fashion:

$$Y_t = Y_{t-1} + \varepsilon_t \text{.....(4)}$$

if the Y_{t-1}coefficient is equal to one, then the unit root problems arise.

Furthermore, the regression estimation is specified as follows:

$$Y_t = \rho Y_{t-1} + \varepsilon_t \text{.....(5)}$$

If ρ is equal to one, then the variance of the variable Y_t is non-stationary or does not contain a unit root (random walk). Based on the equation above, the left and right sides are reduced by Y_{t-1} and the equation be converted into:

$$Y_t - Y_{t-1} = \rho Y_{t-1} - Y_{t-1} + \varepsilon_t \text{.....(6)}$$

$\Delta Y_t = (\rho - 1)Y_{t-1} + \varepsilon_t$.....(7)

$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t$.....(8)

Where:

$\Delta Yt = Yt - Yt-1$

ε = error term

The stationarity test hypotheses are in this manner:

H0: δ = 0 (a unit root is present or Yt time-series data is not stationary)

H1: δ ≠ 0 (a unit root is not present or Yt time-series data is stationary)

If δ = 0, then ρ = 1. It means a unit root is present, where the Yt time-series data is not stationary. Whether the data is stationary or not is dependent on the comparison of the P-value statistic between MacKinnon and 5%. Unless the P-value is higher than 5%, H0 shall not be denied or the data is not stationary, but if the P-value is lower than 5%, then H0 is denied or the data occurs to be stationary.

In the previous model, it is almost impossible to assume the error (ε_t) is uncorrelated. To anticipate this correlation, Dickey-Fuller developed the above test called the ADF test with the following formulation:

$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t$ ..... (9)

Optimum Lag

Optimum lag is a way to choose how much lag is used in a study before carrying out cointegration, granger causality, VAR, and VECM tests. Determining the optimum lag is an essential step in the VAR model, considering that the purpose of building a VAR model is to see the behavior and relationships of each variable in the system. One of the most commonly used method is the Akaike Information Criterion (AIC), which is used to evaluate the duration of the lag. Where the formula is:

AIC = T Log |Σ+ 2 N.....(10)

Σ is the essential factor of the residual matrix of variance or covariance, while N is the sum of parameters calculated in all formulas. Gujarati (2004) provides guidance in seeing the AIC value, where the lowest AIC value obtained from the VAR estimation results with various lags shows that the lag length is best to use. The selection of the optimum amount of lag is necessary to obtain better results or avoid autocorrelation.

Cointegration Test

The cointegration test is conducted to resume the evaluation of non-stationary time-series data. The premise of the cointegration method is that certain time-series data will deviate from their short-term average and shift together (comovement or cointegration). For a longer time, the data move toward steadiness in the long term. When many variables shift all in the same direction in the lengthy period, it can be assumed that the model's variables are cointegrated.

The economic understanding of cointegration is a principle of co-integration that refers to the presence of a long-term steadiness, in which the economic structure converges, ideally, over time. If a shock happens in an economic system, there will be a force that encourages the economy to recover back to its steadiness condition in the long term.

A number of approaches are used to test cointegration relationships, namely those of Engel and Granger (1987), Johansen and Juselius (1990), and Johansen (1991), but the cointegration test approach frequently employed in the VECM method is the Johansen approach. The hypothesis of the Johansen cointegration test is:

H_0: r = r* < k (has no cointegration relationship)

H_1: r = k (has cointegration relationship)

To calculate the results is to analyze the value of the Trace Statistic and the Max-Eigen Statistics for each amount of the critical value at (None*). The null hypothesis will be recognized when the critical value is 1%, 5%, or 10% higher than the Trace Statistic value and the Max-Eigen Statistic value. Conversely, the null hypothesis will be denied when the critical value is 1%, 5%, or 10% fewer than the Trace Statistic and the Max-Eigen Statistics. The rejected

null hypothesis in this analysis means the formula being tested has a cointegration relationship. A whole other approach to evaluate the outcomes is by looking at the probability of each statistic. If both values are a lesser amount of the critical value (1%, 5%, or 10%), then the null hypothesis is rejected. If the Johansen approach test outcomes demonstrate a cointegration relationship in the variable equation, then the VECM method is the next tool that can be applied to establish long-term and short-term associations. However, if the Johansen test outcomes reveal that the variable equation does not have a cointegration relationship, the method used is not the VECM method, but the Unrestricted VAR method.

Vector Error Correction Model (VECM)

From the VECM estimation results, relationships in long and short periods among independent and dependent variables is obtainable. The t-test is performed by contrasting the t-statistics with the t-table to see the importance of the effect. When the t-statistic is higher than the t-table, this means that the independent variable has a major influence on the dependent variable. Next is the model's feasibility investigation by comparing the P-value. If P-value is > 0.05, it implies that H0 will be accepted and that there is no residual autocorrelation, or in other words, the optimum lag has met the feasibility of the model. In the coefficient of the error correction term (ECT) depending on the sign and the outcome of the coefficient significance test using the t-test statistics of OL S method, study of the long–term causality relationship between the independent and dependent variables in VECM modeling can be seen. The short-term formula is presented below:

$$\Delta Y_t = \gamma_{10} + \gamma_{11}\Delta Y_{t-1} + \gamma_{13}\Delta Z_{t-1} + ECT_{t-1} \quad \text{....(11)}$$

4. DATA ANALYSIS AND DISCUSSION

The calculation's results of the stationary test using the unit root test indicate that the degree and first difference data also have non-stationary variables. However, in the second difference, all variables are stationary, as seen in Table 1 below:

Table 1
Results of The ADF Unit Root for Stationarity

Variables	Probability (P-Value)			Result
	Level	First Difference	Second Difference	
EXP	0.0775	0.0000	0.0000	I(2)
INF	0.5074	0.1312	0.0000	I(2)
FDI	0.0067	0.0000	0.0000	I(2)
ER	0.75	0.0017	0.0000	I(2)
PDB	0.0005	0.0000	0.0000	I(2)

Source: processed data

Furthermore, the lag length calculation uses sequential modified LR test statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quin Information Criterion (HQ) at the 5% level. The optimum lag is concluded by selecting the largest number of sequential modified LR test statistic or the smallest value of Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ). The optimum lag length utilized in this work is the fifth lag, since there are five significant criteria. The results of the lag length calculation are shown in Table 2 below:

Table 2
Results of Optimum Lag

Lag	LogL	LR	FPE	AIC	SC	HQ
0	394.3972	NA	3.88E-17	-23.59983	-23.37309	-23.52354
1	446.4463	85.17122	7.68E-18	-25.23917	-23.87871	-24.78142
2	485.1115	51.55362	3.75E-18	-26.06736	-23.57318	-25.22815
3	551.9236	68.8367	4.07E-19	-28.60143	-24.97353	-27.38075
4	609.9093	42.17144	1.12E-19	-30.60056	-25.83895	-28.99843
5	719.935	46.67755*	3.29e-21*	-35.75363*	-29.85830*	-33.77003*

Source: processed data
* indicates lag order selected by the criterion

Depending on the outcomes of the Johansen cointegration test exhibited by the trace test and the maximum eigenvalue test, it is understood that there are two cointegration formulas since the trace statistic value and the Max-Eigen Statistic value are either 5 % higher than the critical value or the P-Value is less than 0.05. It suggests that the alternative hypothesis is acknowledged, which indicates that there is a cointegration relation, as seen in Table 3 below. Furthermore, because the Johansen cointegration test results reveal a cointegration relationship in the variable equation and it is stationary in the second difference, the analysis can be continued to the next method, namely the VECM method, which is utilized to defined the long-term and short-term relationships.

Table 3
Results of Johansen Co-integration Test

	Unrestricted Cointegration Rank Test (Trace)			Unrestricted Cointegration Rank Test (Maximum Eigenvalue)		
Hypothesized No. of CE(s)	Trace Statistic	0,05 Critical Value	Prob.**	Max-Eigen Statistic	0,05 Critical Value	Prob.**
None *	182.6872	76.97277	0.0000	103.6644	34.80587	0.0000
At most 1	79.02289	54.07904	0.0001	47.55285	28.58808	0.0001
At most 2	31.47004	35.19275	0.1194	17.38248	22.29962	0.2111
At most 3	14.08756	20.26184	0.2834	8.727017	15.8921	0.4637
At most 4	5.360541	9.164546	0.2462	5.360541	9.164546	0.2462

Source: processed data
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Based on the result of the stationarity and the data cointegration tests, the estimation of the model is then conducted using a restricted VAR, which is VECM. In this stage, the VECM estimation results between the research variables are presented in Table 4 below. This is often understood that, in the short term, there are four variables that have a direct impact on manufacturing exports plus one error correction variable. The four variables are important at the 10% real degree, with a t-table value of 1.71088. The four variables are inflation in lag 1, FDI in lag 1, and GDP in lag 1 and 2. In comparison, the substantial error correction parameter indicates that there is a short-term improvement process for long-term steadiness. This is indicated by the negative error correction term (ECT) value of 0.9032, which can be interpreted that short-term steadiness fluctuations will be adjusted

towards long-term steadiness, where around 90.32% of the adjustment process occurs in the first quarter. The remaining 9.68% of the adjustment process occurs in the following quarters.

Table 4
Result of Vector Error Correction Model

The Short Term		
Variabel	Coefficient	t-statistik
CointEq1 *	-0.90315	-2.62733
D(LNEXP(-1),2)	-0.28416	-1.04098
D(LNEXP(-2),2)	-0.37085	-1.54305
D(LNEXP(-3),2)	-0.11979	-0.6396
D(INF(-1),2) *	-0.04205	-2.0645
D(INF(-2),2)	-0.02196	-1.13531
D(INF(-3),2)	-0.00049	-0.03747
D(LNKURS(-1),2)	-5761.82	-0.89703
D(LNKURS(-2),2)	-864.48	-0.15866
D(LNKURS(-3),2)	725.1009	0.12497
D(LNFDI(-1),2) *	-0.12163	-1.96957
D(LNFDI(-2),2)	-0.06033	-1.19156
D(LNFDI(-3),2)	-0.00205	-0.06799
D(LNPDB(-1),2) *	4.198521	1.81758
D(LNPDB(-2),2) *	3.156927	1.75115
D(LNPDB(-3),2)	-0.34867	-0.27743
The Long Term		
Variabel	Coefficient	t-statistic
D(INF(-1))	-0.058044	-3.83782
D(LNKURS(-1))	-7857.088	-1.41691
D(LNFDI(-1))	-0.185038	-2.55188
D(LNPDB(-1))	7.462824	2.13306
C	-0.098814	-2.44583

Source: processed data
* Test critical values at 10% level (1.71088)

In the short term, the inflation and FDI factors in lag 1 have a negative effect on Indonesia's manufacturing exports. The constant value for inflation is negative 0.04205, which means that for every 1% increase in inflation, exports will decrease by 0.04%. Inflation causes the prices of exported goods to become more expensive in the eyes of foreign consumers, resulting in decreased demand and affect the export output to decline. Among the causes of domestic inflation is imported inflation. This will impact the manufacturing industry that is export-oriented and reliant on imported raw materials, where production costs are high and thus increase the selling price of export goods. The acceleration of production continuity needs to be maintained, for that the government must always evaluate and draft the latest regulations, especially for the manufacturing sector reliant on imported raw materials, such as providing convenience for raw materials imports. This study's results support the findings of previous studies by Özgur Uysal and Abdulakadir Said

Mohamoud (2018) and Abidin et al. (2013) that inflation negatively affect exports.

Similar to inflation, FDI in lag 1 also negatively affect manufacturing exports. It is suggested by the value of the coefficient which is negative 0.12163, where every time there is an increase in FDI by 1%, manufactured exports will decrease by 0.12% or vice versa. When viewed in terms of growth, FDI in the manufacturing sector tended to decline during the period of this research. Even though in 2015-2016 there was an increase, its growth declined again. In fact, in 2019, it achieved negative growth. At the same time, during the same period, exports experienced an increase. The decline in FDI growth could be made possible by the weakening of the rupiah, which resulted in a decrease in the price of manufacturing export goods so that overseas consumer demand and the export value of manufactured products increased. Another thing that can illustrate the negative relationship among manufacturing exports and FDI is that FDI around the manufacturing sector is not encouraging export activities optimally, especially the process of technology and managerial transfer and employment.

Furthermore, the GDP factor in lag 1 and 2 in a brief period positively affect exports of manufactured products. The GDP coefficient value in lag 1 and 2 are 4.198521 and 3.156927 respectively. This means that every time there is an increase in GDP by 1% in lag 1 and 2, manufacturing exports will increase by 4.20% and 3.15% respectively. An increasing GDP indicates an increase in economic activity, as the amount of services and products provided in the economy and expanding employment opportunities. Labor turning-point in the manufacturing sector can increase the company's ability to produce goods to be exported. This study's findings where GDP is a factor that can positively influence export performance support the preceding investigations by Abidin et al. (2013), Bakar et al. (2015), Haseeb et al. (2014), Nguyen (2010), Oo et al. (2019), and Tumwebaze Karamuriro, 2015.

Likewise, in the long run, the inflation factor and FDI in lag 1 negatively affect manufacturing exports. Meanwhile, the factor of GDP in lag 1 positively affect manufacturing exports. Meanwhile, the factor of exchange rate, either in a brief or long period, does not affect manufacturing exports. These results indicate that the weakening of rupiahs against dollars does not adequately affect overseas consumer demand even though prices have become relatively cheaper. It is possible that many non-price factors influence foreign consumer demand; one example is product quality. The finding supports the findings of the previous research conducted by Jongwanich (2010).

Government policies to encourage increased exports of manufactured products need to be improved. Short-term policies, such as improving the business climate through integrated licensing services, tax incentive facilities, and vocational development, may support export activities. The integrated licensing service is expected to attract investors to invest and no longer think that Indonesia is a difficult country to start investing in. Increasingly intense rivalry among countries around the world to obtain FDI urges Indonesia more to develop the investment environment through a more robust policy structure and in line with investors' demands. The many barriers to foreign investors' entry, ineffective bureaucracy, and less accommodating infrastructure are some of the causes why Indonesia is less desirable to international investors. To date, foreign investments has mainly been in the type of portfolio investment in stocks and bonds, where this form of investment is very vulnerable to negative issues, so it is easy to flow out.

Additional policies that must be optimized include the selection of superior commodities, simplification of procedural and economic diplomacy, as well as improved market access. Long-term policies that can support export activities must

also be improved, such as developing infrastructure and human resources (HR). Strategic steps to boost exports need to be pursued, although it is undeniable that the dynamics of the global economy have an impact on the Indonesian economy. The increased export yield is expected to reduce the current account deficit.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

In the short term, the inflation and FDI factors in lag 1 have damaging effects on manufacturing exports. Meanwhile, the GDP factor in lag 1 and lag 2 positively affect manufacturing exports. Likewise, over a long haul, the inflation factor and FDI in lag 1 negatively affect manufacturing exports, whereas GDP in lag 1 gives a positive impact. Meanwhile, the exchange rate factor does not affect manufacturing exports, either for a brief or long period.

The findings of this research imply that to avoid a decline in manufactured export results due to the rising inflation rate, a policy is needed to provide incentive facilities in the form of exemption or reduction of export taxes and convenience in doing export activities. In addition, in order for FDI to positively impact on increasing export yields, policies in the short term are needed, such as improving the business climate through integrated licensing services, tax incentive facilities, and vocational development. The integrated licensing service is expected to attract investors to invest and no longer think that Indonesia is a difficult country to start investing in. Investment so far has been dominated by portfolio investment, which is very vulnerable to negative issues so that it cannot last for a long time. The results of this research also indicate that the GDP factor in either a brief or long period positively impact manufactured exports. Therefore, it is vital to determine the selection of superior commodities, simplify procedural and economic diplomacy, and improve market access. As for policies that are long-term in nature and can encourage export activities, they must also be improved, such as developing infrastructure and human resources (HR).

However, this study has limitations as it only includes four independent variables, which are inflation, FDI, the exchange rates, and GDP in the manufacturing sector. Several other factors, such as transportation costs, distance to trading partners, labor force, and economic growth of trading partner countries, cannot be covered in this analysis because of the research period limitation so that it is not possible to include a large number of independent variables. Suggestions for future research are to develop this research using panel data that involves cross-section objects and time-series data of other economic sectors besides the manufacturing sector, such as the agriculture or mining sector. Additionally, further research can also be conducted to classify the determining variables of exports from two sides, particularly the supply side and the demand side of exports in each economic sector.

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3	2017	The Influence Of Gross Domestic Product And Productivity Of Labours To Foreign Direct Investment Inflow To Indonesia's Economy Sector In Period Of 2005-2014	Call for Paper pada International Research Conference on Management and Business, Agustus 29, 2017 at The Hotel Golden Flower Bandung
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