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Analysis of Determinants of Indonesian Nickel Exports Towards an Energy Sovereign Country

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ABSTRACT
This research aims to analyze the determinants that influence Indonesian nickel exports. The determinants used in this research consist of internal factors of national Nickel production, Rupiah exchange rate against the Dollar, investment and external factors, total GNP of European countries, and total investment of European countries. This research uses the Vector Error Correction Model (VECM). The research results show that in the short term the Nickel production value variable has a negative effect, foreign investment from Europe has a positive effect, domestic investment has a negative effect, gross domestic product per capita from European countries has a positive effect, and the Rupiah exchange rate has a negative effect on Indonesian Nickel exports. Then, in the long term, the nickel production value variable has a positive influence, foreign investment from Europe has a positive influence, domestic investment has a negative influence, gross domestic product per capita from European countries has a negative influence, and the dollar exchange rate has a positive influence on Indonesian nickel exports. From the results of this research, it can be explained that national nickel production and foreign investment from Europe greatly contribute to the value of nickel exports in the long term. However, domestic investment in the mining sector has a negative impact, meaning that investment uses a lot of non-nickel or imported raw materials. The GDP per capita of European countries also has a negative effect, meaning that production from European industry is not completely dependent on Indonesian nickel raw materials.

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INTRODUCTION

As a country that has rich natural resources, Indonesia has an absolute advantage in producing and ultimately exporting to other countries. Export activities are very important for Indonesia to support high production levels and as a source of foreign exchange income for the country. Export is the process of transporting goods from one country to another country. Apart from being included in trade activities, exports also increase economic growth and increase international cooperation between countries in the world. Exports are believed

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to play an important role in economic growth, which facilitates the economy in the process of economic development. Exports are a component of aggregate demand. Increased exports will help increase aggregate demand and lead to higher economic growth. Exports contribute to improving the balance of payments, employment levels and living standards; therefore, governments try to help and encourage their exporters to export more (Özgur & Abdulakadir, 2018). Indonesia's export commodity which is currently a problem in international trade is the issue of the ban on nickel ore exports by the Indonesian government. This ban caused problems for the European Union community, which ultimately resulted in the European Union suing Indonesia to the World Trade Organization (WTO) regarding the export ban which was effective starting January 1, 2020. The European Union was irritated by Indonesia's policy of banning nickel ore exports, which had a detrimental impact on the steel industry. in European Union countries due to limited access to steel raw materials. Indonesia itself currently controls more than 20% of total world nickel exports. This country is the second largest nickel exporter for the steel industry of European Union countries. The value of Indonesia's nickel ore exports has increased sharply in recent years. It was recorded that Indonesia's nickel ore exports increased significantly by 18% in the second quarter of 2019 compared to the same period in 2017.

The government encourages mineral processing to be carried out domestically to provide added value rather than exporting it in the form of raw ore. Downstreaming or efforts to increase the added value of mineral and coal mining are regulated in Law Number 4 of 2009 concerning Mineral and Coal Mining. Article 95 letter c of Law Number 4 of 2009 explicitly states that mining business permit holders are obliged to increase the added value of domestic mineral and coal resources. Research on the export of a product has been discussed in many articles. This research examines Indonesian nickel exports because this product is a global issue in international trade. This research is interesting in terms of Indonesia's interests to see how big the determinant factors are that influence Nickel exports in Indonesia. Investment is an important factor in boosting exports. In the research "Determinants of Export Performance in East African Countries", the determinants of exports in East African countries state that the workforce, industrialization, foreign investment, and positive exchange rates have an impact on the value of exports. On the other hand, inflation has a negative impact on export performance. (Özgur & Abdulakadir, 2018).

The results of other research on "Determinants of Cocoa Exports in Indonesia" determine Indonesian Cocoa exports showing that the production variable has a significant positive effect, international prices have a negative sign and the exchange rate variable against the US Dollar has a significant positive effect on the volume of Indonesian Cocoa exports. (Wardhany & Adzim, 2018). In research on "A Structural Analysis of the Determinants of Export Performance: Evidence from Turkey" the structural analysis of the determinants of export performance in the case of Turkey shows that environmental and managerial factors, marketing strategies, influence the export performance of companies in Turkey, but not for geographic characteristics. be a determinant of a company's export performance (Ayan & Percin, 2005). Then a study in Swaziland on "An Empirical Analysis of Determinants of Swaziland's Export Performance" empirical analysis of the determinants of export

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performance in that country shows that foreign direct investment (FDI), world demand, and nominal exchange rates are the main important factors in determining good export performance in long term and short term. However, the variables real GDP and domestic demand do not significantly influence export performance in Swaziland (Kabuya, 2014). In the study "Export Determinant Analysis: Indonesia's Exports to Singapore and Japan Case Study" the determinants of Indonesia's exports to Singapore and Japan, the study found that in the long term, the exchange rate has a negative effect on Indonesian exports, both for Singapore and Japan, while in the short term the exchange has nothing to do with exports. Furthermore, the economic growth of trading partner countries in the long term has a positive impact on exports, while in the short term it has no impact (Sumiyati, 2020).

The aim of this research is to try to analyze the factors that influence Indonesian Nickel exports to European countries so that when the policy of banning Nickel exports to Europe becomes a hot issue in international trade between Indonesia and Europe. This research includes internal and external variables. The internal variables are national nickel production, the Rupiah exchange rate against the dollar, investment, while the external variables are the total GNP of European countries and the total investment of European countries. From this research, it will be possible to know the important factors that influence Indonesian Nickel exports and how much dependence the industry or investment of European countries has on Indonesian Nickel.

Research on "Determinants of Coffee Export Performance in Ethiopia" shows that the real influence of the exchange rate in the long and short term is not statistically significant but for coffee quality and coffee production it has a significant effect. The policy implication in this research is that improving the quality of coffee exports and increasing domestic production is believed to have a significant influence on the supply of coffee exports (Tadese Gebreyesus, 2015).

The research entitled "A Region-Wise Analysis of Export Performance of MSME Sector In India And Its Determinants" was conducted in India using the Tobit Model to empirically test the main determinants of MSME export performance. Research findings show that company size, labor costs, labor productivity, capital costs, share of gross output significantly influence export intensity (Biswas & Singh, 2020). Then research conducted in Ukraine on "Determinants of Export Performance of Ukrainian Firms" explains that the level of productivity, company size, innovation, share of university graduates in productive employment, and international companies influence export performance in Ukraine (Cie et al., 2015).

Research on "The Analysis of Export Determinants of Indonesian Pepper in the International Market" shows that the factors that are statistically significant influence the demand for Indonesian pepper exports are GDP per capita of the importing country, economic distance, export prices, real exchange rate, and participation. in FTAs. GDP per capita of importing countries has a positive effect on the volume of Indonesian pepper exports. Meanwhile, economic distance, export prices, real exchange rates, and participation in FTAs have a negative effect on the volume of Indonesian pepper exports (Inayah et al., 2016). Then the next research on "Determinants of Indonesian Crude Palm Oil Export: Gravity

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Model Approach" shows that the results of this research show that not all variables have a significant effect on CPO exports. Variables such as Indonesia's GDP and GDP of major trading partners show positive results, while the influence of the rupiah exchange rate and domestic consumption variables have a significant negative effect on Indonesia's CPO exports. Apart from that, with the Gravity model, the distance variable has a negative and significant effect on Indonesian CPO exports (Ridwannulloh & Sunaryati, 2018).

Research in Lithuania entitled "The Determinants of The Competitiveness of Lithuanian Export: Macroeconomic Approach" shows that GDP (Gross domestic product) per capita and state revenues from taxes and social contributions can explain Lithuania's export trends (Remeikienė et al., 2019). Meanwhile, research on exports conducted in India with the title "Determinants of Export Performance of SMEs: An Empirical Analysis of Literature Pertained to India" shows that the results show that there is a significant influence on the export performance of SMEs in India and company characteristics, export marketing strategies, quality. products, R&D, country infrastructure, and access to finance (internal & external) have a negative and significant effect on SME export performance. Meanwhile, company age, technology purchases, the Indian rupee exchange rate, domestic products and business group affiliation do not have a significant effect on the export performance of SMEs in India (Khokhar, 2018). Research on the influence of production on exports was carried out by Putra & Sutrisna (2017).

The results of this research state that the variables of production and inflation influence exports and economic growth, while production has an indirect effect on economic growth through exports and inflation has no indirect effect on economic growth through exports. This result is that to increase economic growth, the government and related agencies must be able to increase production and export value and be able to control domestic inflation movements by maximizing the role of regional inflation control teams. Another research was conducted by Kusuma, et al. (2017). This research aims to analyze the influence of tea production on the volume of Indonesian tea exports in the short and long term. The results of the research concluded that in the long term, Indonesian tea production has a positive effect on the volume of Indonesian tea exports, where the higher Indonesian tea production will increase the volume of Indonesian tea exports, and vice versa. In the short term, the growth of Indonesian tea production has a significant and positive effect on the growth of Indonesian tea export volume. Every increase in Indonesian tea production by one ton will increase the volume of Indonesian tea exports.

Research on the influence of investment on exports was conducted by Li & Park (2016) with the title "Trade characteristics of foreign direct investment inflows in China: Empirical evidence from China". The results of this study show that FDI inflows have a strong positive effect on international trade in China's provinces and China's regional trade, and that most foreign companies in China are export-oriented which is strongly characterized as a labor-intensive industry, especially the contribution of FDI. Another research was conducted by Yu & Zhao (2008) with the title "The impacts of Japanese direct investment in China on the Sino-Japanese bilateral trade". This research shows that Japanese direct investment in China has contributed not only to increased Chinese exports to Japan, but also

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to increased Chinese imports from Japan. This shows that the relationship between Japanese direct investment in China and bilateral trade is complementary.

Research conducted by Zhao & Wang (2009) with the title: "China's pattern of trade and growth after WTO accession: Lessons for other developing countries" regarding the relationship between investment and exports, concluded that there were two main findings: market liberalization alone is not enough, and system reform economics and liberalization are closely related and complement and promote each other. Other results of experiments through special economic zones (KEK) and the opening of foreign direct investment (FDI) which facilitate and support cluster development and learning-by-doing, are needed to increase industry and export competitiveness.

Research on the influence of GDP on exports was carried out by Adeosun & Gbadamosi (2021) with the title "Impact of non-oil sectors on GDP/capita in selected African countries: evidence from panel analysis". The research results show that the independent variable industry has no effect on the economic growth of these countries, while the findings show that industry has a causal relationship with economic growth. Economic growth has no causality in industry, which means industry does not contribute to economic growth. This study also does not show causality from exports and services to economic growth, but causality runs from economic growth to exports and services. Another research conducted by Upadhyay & Roy (2016) entitled "Impact of exchange rate movement and macro-economic factors on exports of software and services from India" concluded that the real effective exchange rate does not have a significant impact on exports of software services; The US dollar-Indian Rupee exchange rate has no significant effect on software services exports; external gross domestic product growth has no significant impact on software services exports; and India's gross domestic product growth did not have a significant impact on software services exports. The results obtained from multiple regression analysis are also supported by the results obtained from the Granger Causality test. It does not identify a single factor as the primary cause of software exports. The results show that external GDP has a statistically significant impact on software exports.

Research on the influence of exchange rates on exports was conducted by Kandil & Dincer (2008) with the title: "A comparative analysis of exchange rate fluctuations and economic activity: The cases of Egypt and Turkey". The results of his research were anticipated exchange rate appreciation had significant adverse effects, reducing real output growth and demand for investment and exports, while increasing price inflation in Turkey. Random fluctuations in Turkey have asymmetric effects that highlight the importance of unexpected depreciation in shrinking output growth and growth in private consumption and investment, despite an increase in export growth. In Egypt, exchange rate appreciation is anticipated to reduce export growth. Given the asymmetry, the net effect of unpredictable exchange rate fluctuations, in Egypt, is to reduce real output and consumption growth and increase export growth, on average, over time.

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METHODS

This research uses a quantitative research approach with a linear regression approach. Quantitative research is systematic scientific research into parts and phenomena and their relationships. The aim of Quantitative Research is to develop and use mathematical models, theories and hypotheses that are associated with the phenomena that occur.

Quantitative research methods according to Sugiyono's view (2012: 8) are: research methods based on the philosophy of positivism, used to research certain populations or samples, data collection using research instruments, quantitative/statistical data analysis, with the aim of testing hypotheses that have been set. Linear regression (Gujarati, 2003) is defined as an analysis of the dependence of a variable on another variable, namely the independent variable, to make an estimate or prediction of the average value of the dependent variable by knowing the value of the independent variable.

The variables and data used in this research include internal variables such as Indonesian nickel exports, Indonesian nickel production, foreign investment from European countries in the mining sector, domestic investment in the mining sector, per capita income in European countries, the Rupiah exchange rate against the dollar. Then to get the right results, there are several steps using standard procedures. The following steps in the VECM model procedure are as follows: (i) Unit Root Test; (ii) Determining the optimum lag length; (iii) Stability test; (iv) Cointegration Test; (v) Grangrer causality test; (vi) Panel Vector Error Correction Model (VECM); (vii) Impulse Response Function; and (viii) Impulse Response Function (IRF) (Gujarati, 2003).

$$\Delta \text{Ekspor}_{ti} = \beta_0 + \beta_1\Delta\text{Ekspor}_{t-1i} + \beta_2\Delta\text{Ekspor}_{t-2i} + \beta_3\Delta\text{Prod}_{t-1i} + \beta_4\Delta\text{Prod}_{t-2i} + \beta_5\Delta\text{PMA}_{t-1i} + \beta_6\Delta\text{PMA}_{t-2i} + \beta_6\Delta\text{PMDN}_{t-1i} + \beta_7\Delta\text{PMDN}_{t-2i} + \beta_8\Delta\text{GDPCE}_{t-1i} + \beta_9\,\Delta\text{GDPCE}_{t-2i} + \beta_{10}\,\Delta\text{KURS}_{t-1i} + \beta_{11}\Delta\text{KURS}_{t-2i} + + \varepsilon_t$$

Where, Exports are Nickel Exports (tons); Prod is Nickel Production (tons); PMA is foreign investment from European countries in the mining sector, PMDN is domestic investment in the mining sector; GDPCE is Gross Domestic Product per capita of European Countries; Exchange rate is the Rupiah exchange rate against the Dollar; β is Coefficient; Δ is First Different (first derivative data); 1t is Lag 1; 2t is Lag 2.

RESULTS AND DISCUSSION

VECM Estimation

In the Stationary Data First Difference test, the results of the Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square tests concluded that all variables passed the stationary test on first difference data. Stationary test results on first difference data (1). Then to find out the optimal lag before estimating VECM. Based on the maximum lag length, it can be seen from the number of asterisks (*), the most asterisks are at lag 3. So, the optimum lag length is a maximum of 3. The stability test results show that the values of all moduli are below 1, meaning that the model used meets the stability criteria, so that the Impulse Response Function and Variance Decomposition are valid. In this research, the cointegration test was carried out using the Johansen's Cointegration Test

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method (Maddala and Wu, 1999). Below are presented the results of the cointegration test using the Johansen's Cointegration Test method. From the calculation of the 3 vectors which have statistical trace values and eigen values greater than the critical value of 0.05, this shows that there is cointegration (long-term influence occurring).

Causality testing can be carried out using various methods including the Granger's Causality method (Venet and Hurlin, 2001) and the Error Correction Model Causality. Granger's Causality is used to test the existence of a causal relationship between two variables. The predictive power of previous information can indicate the existence of a causal relationship between y and z over a long period of time. From the results obtained, those that have a causal relationship are those that have a probability value that is smaller than alpha 0.05 and 0.10 so that Ho will be rejected, which means one variable will influence other variables. If all variables are stationary in the first derivative, have passed the optimum lag test, stability test, cointegration test and Granger causality test, the VECM model regression can be continued. The VECM model uses a logarithmic model. In Table 1. The short-term influence of nickel export growth is positively (+) influenced by the per capita economic growth of European countries (changes in GDPCE) 1 year ago and 2 years ago. Nickel export growth was negatively influenced (-) by changes in the 2-year exchange rate. Nickel export growth was influenced positively (+) by the growth of foreign investment in mining in European countries (changes in PMAE) 1 year ago and 2 years ago. Nickel Export Growth was negatively influenced (-) by the growth of Domestic Investment in the mining sector (PMDN change) 1 year ago, and Nickel Export Growth was negatively influenced (-) by nickel production growth (production change) 1 year ago and 2 years ago.

Table 1. Effects in the Short Term

Dependent Variable D(L(EKSPOR))		
Error Correction:	Coefficient	t-statistic
CointEq1	-0.978613	**[-5.01437]**
D (LOG (EKSPOR (-1)))	0.244899	[1.30083]
D (LOG (EKSPOR (-2)))	-0.299692	[-1.23697]
D (LOG (GDPCE (-1)))	4.860207	**[2.12688]**
D (LOG (GDPCE (-2)))	3.995428	**[2.59122]**
D (LOG (KURS (-1)))	-4.016491	[-1.82877]
D (LOG (KURS (-2)))	-4.598846	**[-2.92391]**
D (LOG (PMAE (-1)))	0.985219	**[4.75854]**
D (LOG (PMAE (-2)))	0.436710	**[2.91197]**
D (LOG (PMDN (-1)))	-0.408147	**[-3.98735]**
D (LOG (PMDN (-2)))	-0.081563	[-0.99017]
D (LOG (PRODUKSI (-1)))	-1.777495	**[-3.38428]**
D (LOG (PRODUKSI (-2)))	-2.952865	**[-4.86897]**
C	-0.370698	[-1.84009]
R-squared	**0.748257**	
Adj. R-squared	**0.496514**	

Source: World Bank, processed

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In the long term (Table 2) nickel export growth was influenced negatively (-) by the per capita economic growth of European countries (change in GDPCE). 1 year ago, nickel export growth was influenced positively (+) by the growth in the dollar exchange rate against the rupiah (change in exchange rate). 1 year ago, nickel export growth was influenced positively (+) by growth in foreign investment in the mining sector from European countries (PMAE changes) 1 year ago, growth in nickel exports was negatively influenced (-) by growth in domestic investment in the sector mining (change in PMDN) 1 year ago, and nickel export growth was positively influenced (+) by production growth 1 year ago.

Table 2. Long Term Effects

Variable	Coefficient	t-statistic
LOG (EKSPOR (-1))	1.000000	
LOG (GDPCE (-1))	-3.636773	**[-56.4121]**
LOG (KURS (-1))	5.029393	**[48.6818]**
LOG (PMAE (-1))	0.525713	**[32.7983]**
LOG (PMDN (-1))	-0.337274	**[-16.0048]**
LOG (PRODUKSI (-1))	0.294781	**[5.65375]**
C	3.928124	

Source: World Bank, processed

Impuls Respon Function (IRF)

IRF results show the length of time it takes for one variable to respond to another. The response function to shocks functions to see the dynamic response of each variable if there is a certain shock of one standard error. This response shows the influence of a shock to the dependent variable on the independent variable. If the impulse response image shows a movement that is getting closer to the balance point (convergence) or returning to the previous balance, this means that the response of a variable due to a shock will disappear over time, so that the shock does not leave a permanent influence on that variable. Images showing a shift closer to balance can be seen in Figure 1.b, Figure 1.c, and Figure 2.b.

Based on Figure 1.a, it can be explained that the production response to the Nickel Export shock was negative from the 1st to the 10th period. This is shown by the IRF line which is below the horizontal line from the 1st to the 10th period and experienced the lowest decline in the 6th period. After the 6th to the 10th period the Production response to the Nickel Export shock increased again, however remains negative below the horizontal line. Based on Figure 1.b, it can be explained that the response to the amount of Foreign Investment from European countries in the mining sector to the Nickel EXPORT shock was positive from the 1st period until entering the 7th period. This is shown by the IRF line which is above the horizontal line for the 1st to 7th period and tends to decrease in the 6th to 10th period (indicated by the IRF results being below the horizontal line).

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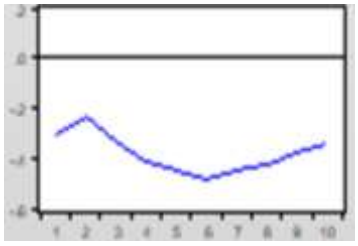

Figure 1.a
Production Response to EXPORTS

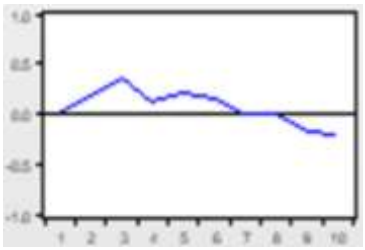

Figure 1.b
PMAE Response to EXPORTS

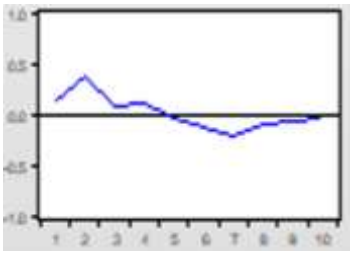

Figure 1.c
PMDN Response to EXPORTS

Figure 1. PRODUCTION, PMAE and PMDN Response to Changes in NICKEL EXPORTS

Based on Figure 1.c, it can be explained that the response of Domestic Investment to the nickel EXPORT shock was positive from the 1st period until entering the 4th period. The 1st to 4th periods tends to decrease but are still above the horizontal line. In the 5th to 10th periods, the response of Domestic Investment to the nickel EXPORT shock was negative.

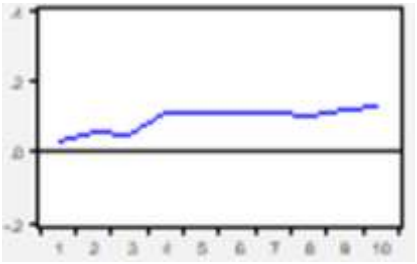

Figure 2.a
GDPCE Response to EXPORTS

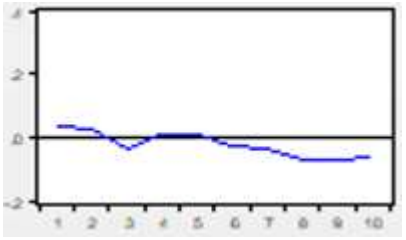

Figure 2.b
KURS Response to EXPORTS

Figure 2 GDPCE and EXCHANGE Response to Changes in NICKEL EXPORTS

Based on Figure 2.a, it can be explained that the response of Gross Domestic Product Per capita European Countries to the Nickel Export shock was an increase from period 1 to period 10 and a sharp increase occurred in periods 3 to 4, meaning that in the long term the response of GDPCE to Nickel Export shock was positive.

Based on Figure 1.b, it can be explained that the response of the dollar exchange rate against the rupiah to the nickel export shock was an increase from the 1st to the 2nd period. After the second period, the response of the dollar exchange rate against the rupiah to the shock of nickel exports began to decline. This can be seen in the picture; the response is below the horizontal line.

Variance Decomposition

Variance decomposition prediction is a prominent tool in interpreting linear and non-linear multivariate time series models along with impulse responses (Lanne and Nyberg, 2016). Variant Decomposition Analysis (VDC) aims to measure the magnitude of the composition or contribution of the influence of the independent variable to the dependent variable. In this research, the VDC analysis is focused on looking at the influence of the independent variables.

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Based on Table 3, it can be explained that in the first period nickel exports were greatly influenced by the nickel export shock itself of 100%. Meanwhile, in the first period, the variables Production, Foreign Investment (PMA), Domestic Investment (PMDN), Gross Domestic Product Income per capita in European Countries (GDPCE), and KURS did not have an influence on nickel exports. Furthermore, in the second period, the variables were Production (contribution 0.39%), Foreign Investment (contribution 17.5%), Domestic Investment (contribution 0.04%), Gross Domestic Product Income per capita in European Countries (3, 79%), and KURS (contribution 0.38%) have an influence on nickel exports. In the 5th period, the variables were Production (contribution 0.67%), Foreign Investment (contribution 14.6%), Domestic Investment (contribution 1.29%), Gross Domestic Product Income per capita in European Countries (0.9%), and KURS (2.87% contribution) have an influence on nickel exports.

In the 10th period, the variables were Production (contribution 0.72%), Foreign Investment (contribution 10.9%), Domestic Investment (contribution 2.3%), Gross Domestic Product Income per capita in European Countries (0.78%), and KURS (contribution 5.76%) have an influence on nickel exports.

Tabel 3. Variance Decomposition of LOG(EKSPOR)

Variance Decomposition of LOG(EKSPOR):

Period	S.E.	L(EKSPOR)	L(GDPCE)	L(KURS)	L(PMAE)	L(PMDN)	L(PRODUKSI)
1	0.482791	**100.0000**	**0.000000**	**0.000000**	**0.000000**	**0.000000**	**0.000000**
2	1.013472	77.87803	3.795429	0.381829	17.51012	0.040131	0.394463
3	1.529091	81.36154	1.725879	0.801255	14.84637	0.723365	0.541598
4	1.858551	79.26365	1.202055	2.249716	15.89582	0.842141	0.546622
5	2.178659	**79.65158**	**0.904192**	**2.871592**	**14.61123**	**1.290124**	**0.671277**
6	2.372670	79.68512	0.881594	4.094092	12.87315	1.794774	0.671273
7	2.534125	78.99903	0.787268	4.837552	12.62500	2.048649	0.702497
8	2.681094	79.31474	0.850580	5.431154	11.48466	2.204469	0.714398
9	2.795577	79.27901	0.806702	5.780957	11.06008	2.361242	0.712008
10	2.932267	**79.50368**	**0.782672**	**5.761684**	**10.90422**	**2.325786**	**0.721962**

Source: World Bank, processed

CONCLUSION

The results of the research above show that in the long term the nickel production value variable has a positive influence, foreign investment from Europe has a positive influence, domestic investment has a negative influence, gross domestic product per capita of European countries has a negative influence, and the dollar exchange rate has a positive influence on exports. Indonesian Nickel. From the results of this research, it can be explained that national nickel production and foreign investment from Europe greatly contribute to the value of nickel exports in the long term. However, domestic investment in the mining sector has a negative impact, meaning that investment uses a lot of non-nickel or imported raw materials. Then the GDP per capita of European countries also has a negative effect, meaning that production from European industry is not completely

dependent on Indonesian nickel raw materials. Thus, the policy of stopping exports of medium nickel remains a policy of tug-of-war, especially with European countries, because on the one hand they want to increase value added and nickel imports by European countries will be diverted to other countries which are rich in nickel. The trend of developing electric vehicles which is becoming increasingly popular in the world should be a serious concern for Indonesia, due to the depletion of nickel reserves. Based on a study by the Coordinating Ministry for Maritime Affairs, 40% of the total manufacturing costs for electric cars are batteries. Electric vehicle batteries use lithium-ion batteries, with the raw materials for the cathode being nickel, cobalt, lithium, manganese, and aluminum. Because Indonesia is one of the countries that has the best nickel raw materials in the world to produce lithium-ion batteries which are the industry of the future, the acceleration of the regulation on the export ban on low grade nickel ore is being carried out to catch up with the momentum of developing electric vehicles in Indonesia in the future. Exports of raw nickel have been prohibited since 2020, with the aim of further processing the raw material to provide added value. In the short term, the export ban will indeed have an impact on reducing Indonesia's export potential, but in the long term the export ban can have a positive impact on the economy. With this export ban, investment in building smelters and downstream industries can increase output, most of which will be exported. Indonesia is the country with the largest nickel ore reserves in the world with 32.7 percent of the world's nickel reserves in Indonesia. After Indonesia, Australia is in second place with 21.5 percent of the world's nickel reserves. Then Brazil with nickel ore reserves of 12.4 percent.

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