

# Impact of Domestic and Global Factors on Indonesian Export Between 1990 and 2020: An Error Correction Model

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**Abstract** - The study aims to investigate factors influencing Indonesian export value between 1990 and 2020. Regarding the domestic aspect, the exchange rate and lending rate are prominent determinants. At the same time, the raw material index, crisis (dummy), and foreign direct investment are considered significant from the global aspects. The study recorded periods of crises, such as the monetary crisis in Asia, the global financial, the European Sovereign, oil, trade, and the COVID-19 pandemic.

The data are stationary at level and cointegrated. Therefore, the error correction model (ECM) is valid. The estimation result also meets the classical assumption. The study concludes that in the long-run only foreign direct investment is insignificant to Indonesian export value during the study period. However, only the lending interest rate is significant in the short run.

**Keywords:** export, exchange rate, lending rate, raw material index, crisis, foreign direct investment

## I. INTRODUCTION

Indonesia is one of the world's biggest economies, with a share of about 2.5 percent of the global output. With US\$1.04 trillion of Gross Domestic Product (GDP), the country is the sixteenth biggest among the G-20 countries. In spite of outstanding GDP accumulation and becoming a G-20 country member, Indonesian output per capita is relatively low in the ASEAN regions. As a result, the country's prosperity is behind the others.

In 2050, PwC (2017) projected that Indonesia would be the eighth most significant economy based on its GDP. Similarly, the Jokowi administration targeted the Indonesian economy to be a high-income country in 2045, with income per capita will be more than US\$21,000. In fact, Indonesian income per capita was merely US\$4,140 in 2021 (Indonesia Statistics, 2022). Thus, Indonesia should transform its economy from a low-middle income to meet the target. The target seems ambitious amid the global turmoil in the last few decades, but it is possible to meet.

Indonesia's economic challenges to achieve a high-income country relies on its economic structure. First, Indonesia economy relies on consumption than productive activity, particularly private consumption (consumption-driven growth). The private consumption share of Indonesia's output is more than 55 percent, while the gross fixed capital formation is about 30 percent (Indonesia Statistics, 2022). Because of personal consumption dominates the output, the country's economic performance depends on customer purchasing power. Therefore, the country needs to maintain a low inflation rate, particularly volatile food inflation. Higher inflation hinder private consumption (Bank Indonesia, 2022).

Secondly, the international trade contribution to Indonesia remained low compared to its counterparts. In 2021, the international trade share to GDP in Indonesia was merely 40 percent, while export contribution to GDP was only 21 percent. As a comparison, the share of international trade in Thailand's economy reached 130 percent of its GDP in 2021, while export contributes about 116 percent to Thailand's output (World Bank, 2022). As the result of the low global trade role in its economy, Indonesia's economy is behind its potential.

As stated above, Indonesia is targeted to be a high-income country; then it should transform its economy from consumption-driven to Export-Led Growth (ELG). Indonesia should maximize the benefit from international trade likely in the advanced economy. For instance, South Korea experienced a significant increase in export goods and

services to GDP during its economic transformation. In 1960, Indonesia's share of export to GDP was higher than Korea's. Notwithstanding, the figure has changed since the Asian crisis in 1997. According to the World Bank (2022) share of export to GDP in Korea reached 41 percent, while it was about 21 percent in Indonesia in 2021.

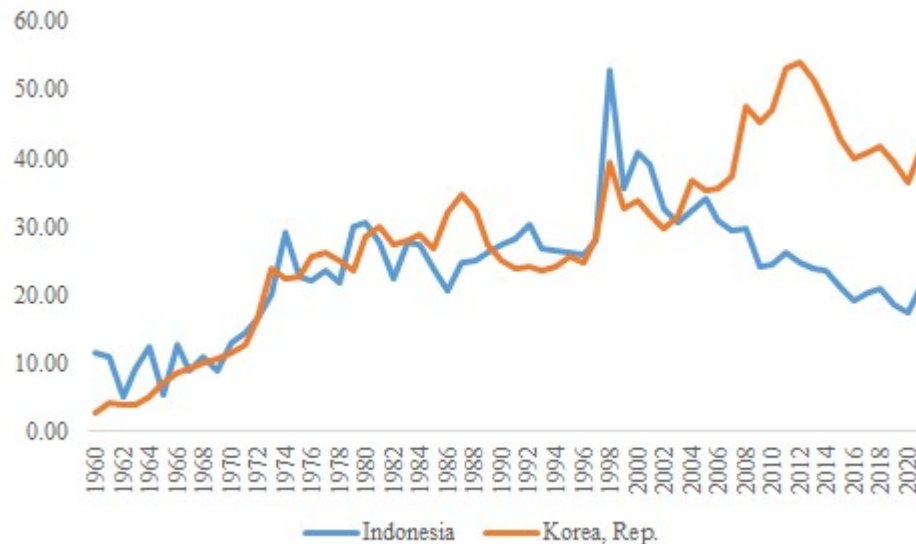


Figure1. Share Export to GDP in Indonesia and Korea

Source: World Bank, 2022, complied

Both theoretical and empirical studies highlight the vital role of international trade in economic growth. Scholars use the ELG to examine export and economic growth. Medina-Smith (2001) argued that ELG is an opportunity for a country to make global trade as an engine of growth. With ELG, the economy comes from domestic and global power, meaning that the economy grow by increasing capital and workforce through export. Hence, it is important to examine the main factors that determine the export value in an economy.

The study aims to investigate the determinant of Indonesian export value as an attempt to produce policy recommendations. The rest of the paper is organized as follows. After the introduction, the paper presents the literature background. The third part is the research method, data estimation result, and discussion. Concluding remarks are given in the last section.

## II. LITERATURE BACKGROUND

### A. *International trade theory and Export-led growth (EGL) hypothesis*

International trade is the capital, goods, and services exchange across countries. Once the country trades with the country, the economy becomes an open economy. There are four benefits of international trade. First, trading among countries has positive spillovers to economic growth. Since a state trades with its partner, the economic growth sources are domestic and global. Most advanced countries gain advantages from global trade due to their competitiveness. Second, global trade stimulates productive economic activity, particularly direct investment in both domestic and foreign. In response to global demand, business entities expand their business through investment. Now, the local business is not only to fulfill domestic but also global demand. Foreign direct investment also takes part in investing in a prospective business.

Third, international trade is the primary foreign reserve accumulation source (Giles and Williams, 2000). Foreign reserves are exerted to meet government debt payment and import purposes by the industrial sector. On the other hand, foreign reserve depicts a country's resilience from global shock. China, for instance, can maintain global turmoil as the country has a vast foreign exchange reserve. Fourth, there is a motivation to increase production efficiency to benefit more from international trade (Thirlwall, 1979). The country will improve its domestic input of production efficiency (labour, capital, and technology adoption) to stay caught up with the trading partner. Thus, export opens opportunities for access to new technologies and skills.

Adam Smith proposed the international trade theory that focuses on absolute advantages. The theory emphasizes input efficiency (labour) in production as the determinant of the strengths and weaknesses of a country's competitiveness. Smith believed that a country gains absolute benefit from international trade as long as the country can produce goods at a lower cost than other countries (absolute advantages in production cost). However, it is relatively challenging to ensure the country has absolute advantages.

The Ricardian model, then, answers Smith's drawback. The Ricardian model is concerned with comparative advantages to gauge the impact of global trade on the economy. The model postulated that the absolute advantages only ensure that some goods can be exported. Therefore, a country's ability to export depends on the comparative advantages and import other goods. As the model consider the value of competitive advantages, the state benefits leading to international specialization. The labour force should be allocated to efficient industries to meet the benefit of international trade.

Another model concerning the global trade benefit on the economy is developed by Heckscher-Ohlin (1933). Heckscher-Ohlin revealed that differences in sources become trade benefits. Sources are named endowment factors. Endowment factors, such as labor, capital, and natural resources, make a country can produce more efficiently than another country. Heckscher-Ohlin (1933) believed that the endowment factor determines the value of a country's exports. A country tends to export goods that use more factors that are relatively abundant in that country. Thus, countries with more natural resources tend to export raw materials to the global economy (Ramly, 2013).

Several theories mentioned above are the basis of the ELG. ELG consists of the neoclassical supply-side model, the balance of payments constrained model, and the virtuous circle model (Thirlwall, 2000). In general, ELG postulates that export becomes the main factor influencing economic growth. Therefore, the country should boost its exports to speed the economic growth.

The neoclassical supply-side model assumes that the relationship between export and economic growth brings externalities to non-export sectors. The export sector output as the non-export sector output depicts externality. The export sector output is assumed by a function of labour and capital. While, the output of the non-export sectors is assumed by a function of labour, capital, and the output of the export sector.

The balance of payment constrained link between growth in the long-run, balance of payment, and deficit. The virtuous circle model focuses on the relationship between export and growth within a cumulative process. The model postulates several assumptions:

1. Output growth as a function of export growth.
2. Export growth as a function of competitive price and income growth in foreign.
3. Price as a function of wage and productivity growth.
4. Productivity growth as a function of output growth.

#### *B. Empirical research of exports*

The Mundell-Fleming Model presents the correlation between exchange rates and the volume of international trade. The exchange rate change will affect the country's trade (import-export activities) since most global payment uses USD (Nezky, 2013).

Research evidence on the impact of exchange rates on export are mixed. Several studies concluded that both have a positive relationship while others are negative. Wilson and Takacs (1979) found the positive impact of devaluation in the case of a fixed exchange rate regime and increasing export revenue export in developed countries. In the case of flexible rates, Bahmani-Oskooee and Kara (2003) find the same conclusion for flexible rates. In contrast, Wilson and Tat (2001) find that appreciation does not lower export revenue in some Asian countries.

A crisis makes trade activity tend to decline (CIECD, 2009). In 2009, world merchandise export fell about 9 percent in total due to the Global Financial Crisis. Export of developed countries fell about 10 percent while declining export in developing countries was 2-3 percent. In Indonesia, during the global financial crisis, the export values recorded shrunken in non-oil and gas products such as vegetable and animal oil, rubber, wood, coffee, tea, and pepper decreased to almost all destination countries (Firdaus, 2010).

The role of the financial sector to export value are essential. Abor et al. (2014) studied the role of bank finance in export activity using a probit model. The study concluded that the export activities of SMEs improved as a positive spillover of bank finance. Abor et al. (2014) identified demand and supply factors influencing loans to SMEs. Loan challenges from the demand side concern the quality of projects proposed by debtors. On the supply, loan faces challenges due to asymmetries of information. As a result, the bank offers high-interest rates. Boediono (1990) argued that high-interest rates make borrowing expensive, so export competitiveness declines.

The background theory of the relationship between FDI and export relies on the multinational enterprise (MNE). The decision of an MNE to invest in a country may have consequences for host countries' export and economic growth. However, the benefit gained from FDI to host country export depends on the factor intensities. Girma et al (2007) argued that the impact of FDI on export is indirect and depends on domestic producers' initial technology and human capital level. Competition in the domestic market and government policies to promote linkages between domestic and foreign firms are also crucial to determining the FDI impact of export value (Barry and Bradley, 1997).

Kutani and Vuksic (2007) examined the relationship between foreign direct investment and export value in 12 Central and Eastern European economies from 1996 to 2004. The study revealed an increase in export supply potential based on the supply capacity-increasing effect of foreign direct investment. FDI increases the host country's capacity for producing goods, increasing export. The quality and quantity of export improve since FDI increase domestic company knowledge, technology, and market destination.

### III. RESEACRH METHOD AND ESTIMATION RESULT

The study collected yearly data from 1990 and 2020 from Indonesian Statistics and Bank Indonesia. The model of the study is underneath.

The macroeconomic models used in this study are as follows.

$$\log X_t = \alpha_0 + \beta_1 \log ER_t + \beta_2 RMI_t + \beta_3 XIR_t + \beta_4 \log FDI_t + \beta_5 D_t + e_t$$

Where:

- logX = Logarithm of Indonesian export value.
- logER = Logarithm of Rupiah exchange rate to US\$ (Rp/US\$)
- RMI = Raw material index
- XIR = Indonesia export loan interest rate (%)
- logFDI = Logarithm of Foreign Direct Investment
- D = Dummy variable of the pandemic crisis, where 0 = not crisis; and 1 = crisis.

The error correction model (ECM) in this study is as follows:

$$(1) \Delta \log X_t = \alpha_0 + \beta_1 \Delta \log ER_t + \beta_2 \Delta RMI_t + \beta_3 \Delta XIR_t + \beta_4 \Delta \log FDI_t + 5D_t - \gamma e_{t-1} + v_t$$

Where:  $v_t$  is "white noise" error term for the short-term, and  $e_{t-1}$  is the error correction term (ECT). All the variables are in their lagged format depicting long-term relations between the dependent and independent variables. The beta's are short-run parameters of the model, gamma is the error correction parameter, and parameters within the ECT (not shown) are long-term parameters.

The estimation results of the unit root test show that the testing of all variables in the research is stationary at level. On the other hand, cointegration test results show short- and long-term relationships between dependent and independent variables. The conclusion refers to the probability of Eigenvalue below 5 percent.

Table1. Estimation Results of the Error Correction Model

Long Term Relations			Short Term Relations		
Variable	Coefficient	Prob	Variable	Coefficient	Prob
logex	0.211322	0.0515*	D(LOGEX)	0.031750	0.8970
RMI	0.007206	0.0005**	D(RMI)	0.000598	0.7721
XIR	-0.025158	0.0003**	D(XIR)	-0.010698	0.0700**
Dummy	0.096136	0.0651*	D(DUMMY)	0.008066	0.8135
logFDI	0.105374	0.1036	D(LOGFDI)	0.077199	0.1789
			ect(-1)	-0.560693	0.0050*
C	3.109124	0.0000	c	-0.00016	0.7958
Adj R <sup>2</sup>	0.904902		Adj R <sup>2</sup>	0.294968	
Prob (F-Stat)	0.00000		Prob (F-Stat)	0.025035	

\*Significant at 10% level; \*\*significant at 5%.

## Discussion

According to the short-run model, the study concluded that only interest rates influenced the export value during the study period. This result confirmed the study conducted by Abor et al. (2014). Interest rate echoes the role of the financial sector on the export value. According to the Financial Authority Service (2022), the share of the export loan to the commercial loan in 2021 was only 3,47 percent. The figure has remained the same in the last few decades. The relatively lower export loan implies the export performance because the exporter fell hard to expand amid the lag of financial support.

Insufficient loan support to the export sector is mainly influenced by a high interest rate. According to the table below depicts the commercial banking interest rate for several loans. From 2018 to 2021, the export loan interest rate declined by only 81 basis points. The figure was the lowest among other sectors. It seems that the export sector is high risk. Compared to other countries, commercial bank loan interest rate in Indonesia is expensive. World Bank (2022) data confirm that commercial banks interest rate in Indonesia was 8.92 percent which was higher than in other countries. In the same year, the interest rate in Korea, Thailand, and Malaysia was lower than 4 percent.

Due to a high interest rate in the domestic market, the exporters make financing from foreign financial institutions. The interest rate differential between the domestic and global was significant, more than 5 percent annually. However, the decision on taking loans from abroad exposes the exchange rate risk for the exporters. In the turmoil of the global economy, the exchange rate risk exposure increase significantly.

The Indonesian government is concerned about the export performance caused by the lag in financial support from commercial banks. The government established the export financing agency (Indonesia Eximbank) to support export financing with the same role as the commercial bank. Siregar (2010) argued that financial and non-financial institution offers trade financing. When financial intermediation is relatively low, the role of non-financial firms in providing loans is more relevant.

Table 2. Loan Interest Rate in Indonesia

	2018	2019	2020	2021	2018-2021
Working Capital	10.37	10.09	9.21	8.63	-1.74
Investments	10.38	9.90	8.88	8.35	-2.04
Consumption	11.73	11.62	10.97	10.53	-1.20
Export	9.88	8.99	8.34	9.07	-0.81
Import	9.50	9.72	9.03	8.62	-0.88

Source: Financial Authority Service, 2022, complied



Figure 2. Commercial Bank Loan Interest Rate 2019-2021

Source: World Bank, 2022, complied

Furthermore, based on the long-run estimation only foreign direct investment is insignificant to Indonesian export value during the study period, and the other explanatory variables statistically impact the export value.

In line with The Mundell-Fleming Model, this study also finds that the exchange rate impacts the export value. There is a tendency to increase the export value in case of domestic currency depreciation. The lower price of domestic products makes the commodity export demand jump. Nevertheless, this condition seems different for the Indonesian case. *Firstly*, Indonesian commodity export price seems more expensive than other countries. It is because the import content of the commodity, for instance, manufacturing goods, is substantial. Depreciation makes raw materials and intermediate goods more expensive. As a result, the production input price increases and impacts the price of export goods. *Secondly*, the majority of export commodity of Indonesia are raw material which are not sensitive to the exchange rate.

The study also highlights the relationship between crisis and export value. It is noted that the crisis made the export value deteriorate due to the global demand softening. However, the impact of the crisis on the export value depends on its severity or embracement. During the global crisis, the COVID-19 pandemic, the impact of its export value is substantial because the crisis is global scale. Consequently, almost all countries experienced declining economic performance both from the demand and supply side since global demand declined, and domestic production also shrunk. In 2020, goods and services volume in advanced economies declined by 8.8 percent, while the figure reached about 6.2 percent in emerging and developing markets (International Monetary Fund, 2022). The export value in Indonesia declined by about 2.61 percent (yoy), while oil and gas exports fell by about 29 percent (yoy). On the other hand, non-oil and gas export value down about 1 percent (yoy).

The monetary crisis in 1997 in Asia is considered a local crisis that hit several regional countries due to the source and the impact only in Asian countries. It can be said that the Asian crisis did not significantly impact Indonesian export value. In contrast, the crisis increased Indonesia's export since the Rupiah depreciation considerably. Demand for Indonesian export jumped since the US and European Union, as the representation of global power, were not hurt by the Asian crisis.

Lastly, the relationship between the raw material index and export value is valid in Indonesia. Export value tends to increase when the raw material index jumps. The reason behind this is that the majority of Indonesia's export is raw material. According to the Bank Indonesia (2022), the share of coal export value reached 13.53 percent in 2022, while base metal products and palm oils are 13.07 percent and 11.39 percent, respectively. The domination of raw materials on export value becomes a challenge since the price is much more volatile. Then, the export value may only sustain in the long-run. Furthermore, the global economy has focused on using green energy resources to combat global warming.

#### IV. CONCLUSION

The study determines factors influencing Indonesia's export value, both domestic and global. The study concludes that in the long-run only foreign direct investment is insignificant to Indonesian export value during the study period. However, only the lending interest rate is significant in the short run.

The loan interest rate is important to soften because this factor makes the export value in the short and long run. In the short run, the interest rate may affect exporter cash flow, while in the long-run the variable influences on the business expansion. Indonesia's commercial bank interest rate is far higher than other countries in Asia, making it costly for the exporter to access credit. On the other hand, accessing financing from abroad seems risky since it makes the exchange rate risk exposure high.

The impact of depreciation on the exchange rate on export value in Indonesia is relatively low since the import content of export is significant. This problem makes the export of Indonesian goods is more expensive compared to other countries.

The crisis positively influences Indonesia's export value if the demand from the main export destination countries is stable. This condition happened during the Asian monetary crisis. However, the COVID-19 pandemic is a global crisis influencing Indonesia's export value because the crisis experience hurt almost all countries in the world.

The high dependence on Indonesian export value to raw materials raises a problem in the middle and the long-run as the global economy will increase clean energy usage.

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