International Journal of Current Economics & Business Ventures, 1 (3) 2023, 259-267
International Journal of Current Economics & Business Ventures
https://scholarsnetwork.org/journal/index.php/ijeb

JOURNAL

The Influence of Exchange Rate, Seaweed Consumption and Economics Distance on Indonesia Seaweed Exports

Zaennuri Muhammad Ihsan Voorneman
zaennurimuhammadihsan@gmail.com
Faculty of Economics, State University of Jakarta

Prof. Dr. Saparuddin Mukhtar, S.E., M.Si
saparuddin@unj.ac.id
Faculty of Economics, State University of Jakarta

Prof. Dr. Sri Indah Nikensari, S.E., M.SE
indah_nikensari@unj.ac.id
Faculty of Economics, State University of Jakarta

Abstract: This research aims to determine the influence of Exchange Rate, Seaweed Consumption, and Economic Distance on Seaweed Export in Indonesia to five destination countries: China, Chile, Japan, the Philippines, and South Korea, during the period of 2001-2021. The data analysis technique used in this study is the gravity model method, including classical assumption tests such as normality test, multicollinearity test, and heteroskedasticity test, as well as hypothesis testing. The Fixed Effect Model was selected for this research. The results of the study indicate that the exchange rate has a positive and significant effect on seaweed export in Indonesia. Furthermore, seaweed consumption also has a positive and significant effect on seaweed export in Indonesia. On the other hand, economic distance has a negative and significant effect on seaweed export in Indonesia during the period of 2001-2021

Keywords: Exchange Rate, Consumption, Economic Distance, Gravity Model, Export

Background

Seaweed is one of the leading export commodities in the global market. This commodity is considered to have high economic value for domestic economic growth and export. Therefore, the government has prioritized the Ministry of Maritime Affairs and Fisheries (KKP) program for seaweed cultivation development from 2022 to 2024. According Cai et al. (2021, p. 3) Indonesia contributes 27.8% of the total global seaweed production, making it one of the largest producers. This advantageous position for Indonesia not only meets domestic seaweed demands but also allows for a large production capacity that can be utilized for exports to foreign markets.

Export Value Of Indonesian Seaweed To Five Destination Countries From 2017 To 2021

Destination Countries	Total Export Value (USD)				
	2017	2018	2019	2020	2021
China	133.393.344	190.029.357	227.614.595	192.961.858	237.257.269
Chile	6.128.908	6.621.040	9.922.195	6.078.101	5.684.442
South Korea	6.068.768	13.236.067	10.164.772	9.736.257	5.562.927
Philippines	4.161.463	2.870.100	3.413.545	2.986.971	6.373.921

Japan	7.963.175	9.434.255	9.336.942	8.104.521	7.442.285
The Total Export Value of Indonesian Seaweed	**204.871.977**	**291.837.226**	**324.849.979**	**279.582.592**	**345.114.331**

Source: Statistics from the Ministry of Maritime Affairs and Fisheries of the year 2022 (Data processed)

Based on the table above, the highest export value is to China, followed by other countries such as South Korea, Japan, Chile, and the Philippines. The total export value of Indonesian seaweed over the past five years has experienced fluctuations, with the lowest total export value recorded in 2017 at 204.8 million USD. In 2021, the total export value of seaweed from Indonesia reached its highest point at 345.1 million USD. The increasing trend in the export value of Indonesian seaweed was halted in 2020 due to the difficult circumstances and situation caused by the COVID-19 pandemic. Consequently, the total export value of seaweed declined in 2020, reaching only 279.5 million US Dollars.

The highest total export volume was recorded in 2021, reaching 225.6 million tons per year. Meanwhile, the average seaweed export volume from Indonesia during that period was 207 million tons annually. China was the primary destination for Indonesian seaweed exports in this commodity trade.The first factor influencing exports is the exchange rate used by a country. The role of the exchange rate in export activities is that in a transaction between two countries, there are two types of currencies involved: domestic and foreign. This results in the existence of an exchange rate (Genc & Artar, 2014, p. 13).

In 2018, the Indonesian rupiah experienced depreciation against the US dollar compared to the previous year. However, the seaweed export volume in 2018 increased compared to the previous year. In contrast, in 2019, the rupiah appreciated with a 100 rupiah decrease, leading to a decline in seaweed export volume in 2019. Another factor influencing a country's exports is consumption. International trade is affected by two factors: supply and demand. High demand will drive a country to meet its domestic needs, and one way to do so is through imports. This situation is advantageous for other countries that have better resources for goods or services needed by neighboring countries. Thus, high consumption in a country will positively impact the export needs of another country.

China, as one of the largest seaweed importers from Indonesia, has an average seaweed consumption of 68,000 tons per year or an annual increase of not more than 0.05 percent. In 2021, China reached its highest seaweed consumption at 71,513 tons per year. Similarly, the Philippines, South Korea, and Japan have stagnant seaweed consumption rates ranging from zero to one percent. The Philippines recorded the highest seaweed consumption in 2021 at 3,313 tons per year, while its lowest consumption was in 2017. South Korea also had its highest seaweed consumption in 2017. In 2018 and 2021, the export rate of Indonesian seaweed increased by 11 and 13 percent per year, respectively. This increase can be attributed to the rising consumption of seaweed by countries that import from Indonesia

Next, another factor that influences international trade, especially exports, is distance. The distance between countries affects bilateral relations, and the accessibility of seaweed exports is considered based on distance. The table above shows that Chile is the farthest destination for Indonesian seaweed exports, approximately 15,950 km away from Indonesia. On the other hand, the Philippines is the nearest destination for seaweed exports from Indonesia. The distance, whether far or near, plays a crucial role in determining Indonesian seaweed exports. Distance serves as a proxy for transportation costs in trade. The geographical distance between two trading partners becomes a significant determinant in trade patterns. This is because greater distances between trading partners

International Journal of Current Economics & Business Ventures, 1 (3) 2023, 259-267
International Journal of Current Economics & Business Ventures
https://scholarsnetwork.org/journal/index.php/ijeb

will increase transportation costs. Therefore, distance is not a single cost borne by the parties involved, but it plays a crucial role in shaping international trade dynamics. (Krugman et al., 2012)

THEORETICAL FRAMEWORK

Internasional trade

According to Diphayana (2018: 3) trade is defined as the exchange of goods, services, and money that mutually benefit and voluntarily advantage each party involved. Meanwhile, international trade is defined as business transactions between parties from more than one country. Examples of such business transactions include exporting products from one country to another, investing in factory development in another country, importing raw materials from abroad, producing some parts of a product abroad and assembling them domestically, as well as borrowing funds from a bank in one country to finance business activities in another.Trade is seen as a voluntary exchange process, where each party has the freedom to determine the gains and losses from the exchange based on their respective interests. This will then determine whether it is necessary to engage in such trade based on the interests of each country involved.

Exchange Rate

Ekananda (2015) reveals that the exchange rate is an amount of money of a specific currency that can be exchanged for one unit of another country's currency. Exchange rate movements have an impact on the value of commodities and assets, as the exchange rate influences the amount of incoming cash flows obtained from exports. If there are changes in the economic conditions in an economy, the currency exchange rate will also change significantly. The exchange rate shows the value comparison between two different currencies. Meanwhile, the exchange rate is defined as the value of one currency when exchanged with another currency. The value of a currency is determined by its exchange rate against other currencies. For example, one euro is equivalent to 1.3 US dollars, or one euro can be exchanged or purchased with 1.3 US dollars (Septiana, 2016, p. 163)

Consumption

According to Samuelson et al. (2004) consumption refers to household expenditures on goods and services. From an economic perspective, consumption is the act of reducing or using up the economic utility of a good or service. On the other hand, Suherman(2001: 147) defines consumption as the utilization of goods and services to satisfy human needs. Consumption is considered an essential purpose of production, or in other words, production serves as a means of consumption. The term "consumption" is understood as the direct use of goods and services to meet human needs. However, there are other types of goods, such as machinery or raw materials, that can be used to produce other goods. This is referred to as productive consumption, while consumption that directly satisfies needs is known as final consumption.

Consumption depends on or is a part of income, which can be represented by the equation Y = C + S, where Y is income, C is consumption, and S is savings. From this equation, the relationship between consumption and income can be expressed as C = f(Y). MPC or Marginal Propensity to Consume, which is defined as the desire to engage in consumption. MPC is the addition in consumption divided by the increase in income. MPC indicates the portion of the increase in income that is consumed. The larger the MPC, the larger the portion of each income increase used for consumption. Conversely, if the increase in income for consumption decreases, the MPC becomes smaller. Based on this explanation, the formula for MPC can be represented as $\mathrm{MPC} = \frac{\Delta C}{\Delta Y}$ (Rosyidi, 2001)

International Journal of Current Economics & Business Ventures, 1 (3) 2023, 259-267
International Journal of Current Economics & Business Ventures
https://scholarsnetwork.org/journal/index.php/ijeb

Economics Distance

According to Krugman et al. (2012) the distance between two countries is the most crucial determinant in conducting geographical trade, as distance can increase transportation costs, although it does not necessarily mean distance is always a cost that must be incurred. According to Sari & Widyastutik(2015: 99) economic distance can be used to avoid singular matrices caused by constant values of exporter and importer's geographical distance each year. To obtain the value of economic distance, a formula is required using the nominal GDP of the destination country and the exporting country. International trade can enhance cooperation and increase a country's income. However, barriers to trade exist, and one of these barriers is distance, which in this context serves as a proxy for transportation costs. The formula for economic distance used by Nurhayatii (2019: 179) the formula is :

$$JE_j = DIS_j \times \frac{PDB_j}{\Sigma PDB_j}$$

The Symbol is,

JE_{j} = Economic distance between the country of origin and the export destination
DIS_j = Distance between the country of origin and the importer
ΣPDB_j = The total GDP of all importing countries in that year

Gravity Model

According to Sebayang (2011) The gravity model is a model used to analyze the flow of money or goods between two geographically separated entities. This theory also explains the potential between countries, known as the theory of gravity, developed by Walter Isard in 1954. The gravity model theory states that the potential for trade between two countries (bilateral trade) is determined by the distance between the two countries and the socio-economic dynamics of each country.The term "gravity" is taken from Isaac Newton's theory of gravity, which states that there is an attractive force between two objects in the solar system, based on their mass or planetary weight. To estimate the potential for bilateral trade, the mass of objects is represented by various socio-economic variables that continue to evolve, including economic growth, per capita income, population size, tariffs, prices, colonial history, language, and culture. Walter Isard formulated the gravity model to predict the value of trade between the two countries (Susila, 2022, p. 103).

$$\mathrm{F_{ij}} = \mathrm{G}\ \frac{M_i M_j}{r_{ij}^2}$$

The Symbol is,

$\mathrm{F_{ij}}$ = The trade value between country i and country j;
G = constant;
$\mathrm{M}_i\mathrm{M_j}$ = object mass i, j
$\mathrm{R_{ij}}$ = distance between objects i dan j

Export

According to Gregory (2006) Exports are various goods and services produced domestically and sold abroad. Export is one of the essential factors in Gross Domestic Product when viewed from the expenditure perspective. When exports experience changes, whether increasing or decreasing, it will impact the income. However, the high level of export activity makes a country's economy more sensitive or prone to fluctuations in the international market and the global economy. According to (2001) Expressing that exports are a trade activity that can stimulate an increase in domestic demand, leading to the growth of larger industries to enhance productivity, along with a positive economic structure and efficient social institutions.

International Journal of Current Economics & Business Ventures, 1 (3) 2023, 259-267
International Journal of Current Economics & Business Ventures
https://scholarsnetwork.org/journal/index.php/ijeb

METHOD

This research uses the object of Indonesia's seaweed export volume. The volume of Indonesia's seaweed export is influenced by exchange rates, seaweed consumption, and economic distance. The scope of this study includes international data, namely the seaweed export volume from Indonesia to five export destination countries, exchange rates, seaweed consumption, and economic distance. The research utilizes data from five export destination countries over a period of 20 years, from 2011 to 2021. The data from these variables are compiled into panel data, which is a combination of cross-sectional and time-series data.The panel data in this research consists of five export destination countries for Indonesia's seaweed, namely China, Chile, Japan, the Philippines, and South Korea, spanning from the year 2001 to 2021. The method used in this study is quantitative analysis using panel data. The collected data will be measured using regression analysis with the panel data gravity model. The researcher chose to use regression analysis with the panel data gravity model because the distance variable is present in the regression equation. Moreover, it helps in identifying the factors that influence Indonesia's trade (export) to the five destination countries. Based on this description, the researcher will employ the panel data regression equation using the gravity model :

$$\mathrm{LnEXP_{it}} = \beta_0 + \beta_1 \mathrm{LnNT_{it}} + \beta_2 \mathrm{LnCSW_{it}} + \beta_3 \mathrm{LnJRK_{it}} + \varepsilon_{it}$$

Keterangan :

$\mathrm{EXP_{it}}$	= The volume of seaweed export from Indonesia
$\mathrm{NT_{it}}$	= Exchange rate (riil)
$\mathrm{CSW_{it}}$	= Seaweed Consumption
$\mathrm{JRK_{it}}$	= Economic distance between trading countries
β_0	= Konstanta
ε_{it}	= *Random error*
β_n	= Estimated parameters (n= 1,2,3…)
i	= Subjek ke-i
t	= Time period ke-t

RESULT

Descriptive statistics results of research variables

The variable "seaweed exports from Indonesia" has an average value of 15.36333 with a median of 15.26660. The highest value is 19.01799, and the lowest value is 12.14260. The variable "exchange rate" has an average value of 4.772290, a median of 4.513444, a maximum value of 7.347096, and a minimum value of 1.606063. The variable "seaweed consumption" has an average value of 9.5042373, a median of 9.827010, a highest value of 10.88427, and a lowest value of 2.249381. The variable "economic distance" has an average value of 6.636040 and a median of 7.765546. The maximum value is 8.376188, and the minimum value is 3.114908.

Panel data regression model test

Based on the results of the Chow test, the probability value for Cross Section F is 0.0000 < 0.05. Therefore, it can be concluded that H_0 is rejected, indicating that the Fixed Effect Model is more appropriate for estimation compared to the Common Effect Model. From the results of the Hausman test, it can be observed that the probability value is 0.0253. This value is smaller than < 0.05, leading

to the rejection of H_0. The Fixed Effect Model is more appropriate for estimation compared to the Random Effect Model.

Normality Test

The Jarque-Bera value with a probability of 0.051788 or rounded to 0.512. This result meets the criteria for a normal distribution, which is > 0.05, so it can be concluded that H_0 is accepted, and the data is normally distributed.

Multicolinearity Test

The correlation coefficient between all independent variables is <0.08, thus leading to the conclusion that the model is free from multicollinearity.

Heteroskedasticity Test

The independent variable X1 Exchange rate is denoted *NT* have value probability 0.0575, the probability value for independent variabel X2 *CSW* have value is 0.6791. and the probability value for the idependent variable X3 JRK is 0.6422 therefore it can be concluded that H_0 is accepted, indicating that there is no heteroskedasticity issue in the variance.

Hypotesis Test

The t-value for each independent variable, NT (Exchange Rate), is 5.359356 > 1.66008 with a probability of 0.0005 < 0.05, leading to the rejection of H_0 indicating that the exchange rate variable has a significant effect on the export volume of Indonesian seaweed. The t-value for the independent variable CSW (Consumption of Seaweed) is 2.238060 > 1.66008 with a probability of 0.0275 < 0.05, leading to the rejection of H_0 suggesting that the consumption of seaweed variable has a significant effect on the export volume of Indonesian seaweed. The next independent variable JRK (Economic Distance) has a t-value of -3.919895 > 1.66008 with a probability of 0.0002 < 0.05, resulting in the rejection of H_0 and it can be concluded that the economic distance variable has a significant effect on the export volume of Indonesian seaweed.

The degrees of freedom (df) are 3.09, while the F-value is 43.41795, indicating that the F-Statistic value (43.41795) > F-table value (3.09), thus H_0 is rejected. The probability value of F-Statistic is 0.000000 < 0.05. Therefore, it can be concluded that H_0 is rejected, meaning that the variables exchange rate, consumption of seaweed, and economic distance together have a significant influence on the export volume of Indonesian seaweed.

DISCUSSION

The Influence Exchange Rate on Indonesia Seaweed Export

Based on the test results, there is a positive and significant relationship between the exchange rate and the export of Indonesian seaweed. This can be seen from the partial or t-test results, where the t-value for the exchange rate variable on Indonesian seaweed export is 5.359356, which is greater than the t-table value of 1.66008, and the probability value is 0.0005, which is less than the significance level of 0.05. These findings are consistent with the results of a study conducted by Eka Yanti & Sudirman (2017: 374) which found that the exchange rate of the US Dollar has a positive and significant effect on the export value of Indonesian ready-made garments from 1995 to 2014. Regarding the regression coefficient for the exchange rate variable, it is positive at 1.911440, indicating that a depreciation or decrease in the domestic currency value would make domestic goods cheaper. As a result, traders may prefer to engage in exports, leading to an increase in Indonesian seaweed export by approximately 1.91%.

The influence Seaweed Consumption on Indonesia Seaweed Export

Based on the test results, it shows a positive and significant relationship with the volume of Indonesian seaweed. This can be seen from the partial test results or t-test conducted on the variable

seaweed consumption towards Indonesian seaweed export, which has a t-value of 2.238060 > t-table 1.66008 (negative sign indicates the direction of influence) and a probability of 0.0275 < 0.05. Looking at the regression coefficient value of the seaweed consumption variable denoted by CSW, which is 0.162434, it means that a 1% increase in seaweed consumption will lead to a 0.16% increase in Indonesian seaweed export. According to Syahfdi, et al.(2010) the demand for a commodity product is influenced by several variables, such as consumer-related variables like income level, which represents consumer purchasing power towards a product, for example, fishery products.

The Influence Economics Distance on Indonesia Seaweed Export

The partial results or t-test indicate a negative and significant relationship between the variable of economic distance and Indonesian seaweed export. This is evident from the economic distance variable towards Indonesian seaweed export, which has a t-value of -3.919895 > t-table 1.66008 (negative sign indicates the direction of influence) and a probability of 0.0061 < 0.05. The results of this study are consistent with previous research conducted by Mayasari, et al. (2021: 49) which found that the economic distance variable has a negative and significant effect on textile exports and textile product exports from Indonesia to ACFTA member countries in the period 2001-2018. Looking at the regression coefficient value of the economic distance variable, which is -0.798737, it indicates that a 1% increase in economic distance between countries will decrease seaweed export by 0.80%. According to Wahyudi & Anggita(2016) distance will have a negative effect on exports because greater distance will result in higher transportation and logistics costs.

CONCLUSION

Based on the research and testing conducted by the researcher on the influence of exchange rate, seaweed consumption, and economic distance on Indonesian seaweed exports, the following conclusions can be drawn:

1. The exchange rate variable has a positive and significant effect on Indonesian seaweed exports to the five destination countries during the period of 2001 - 2021.
2. The seaweed consumption variable has a positive and significant effect on Indonesian seaweed exports to the five destination countries during the period of 2001 - 2021.
3. The economic distance variable has a negative and significant effect on Indonesian seaweed exports to the five destination countries during the period of 2001 - 2021.
4. The exchange rate, seaweed consumption, and economic distance variables together have a significant influence on Indonesian seaweed exports to the five destination countries during the period of 2001 - 2021.

BIBLIOGRAPHY

Cai, J., Lovatelli, A., Aguilar-Manjarrez, J., Cornish, L., Dabbadie, L., Desrochers, A., Diffey, S., Garrido Gammaro, E., Geehan, J., Hurtado, A., Lucente, D., Mair, G., Miao, W., Potin, P., Przybyla, C., Reantaso, M., Roubach, R., Tauati, M., & Yuan, X. (2021). SEAWEEDS AND MICROALGAE: AN OVERVIEW FOR UNLOCKING THEIR POTENTIAL IN GLOBAL AQUACULTURE DEVELOPMENT FAO Fisheries and Aquaculture Circular NFIA/C1229 (En). In *FAO Fisheries and Aquaculture Circular* (Vol. 1229).

Diphayana, W. (2018). *Perdagangan Internasional*. Deepublish.

Ekananda, M. (2015). *Ekonomi Internasional*. Erlangga.

Genc, E. G., & Artar, O. K. (2014). THE EFFECT OF EXCHANGE RATES ON EXPORTS AND IMPORTS OF EMERGING COUNTRIES. *European Scientific Journal, ESJ*, *10*(13), 1857–1887. https://doi.org/10.19044/ESJ.2014.V10N13P

Gregory, M. (2006). *Makroekonomi*. Erlangga.

Krugman, P., Obstfeld, M., & J. Melitz, M. (2012). *International Economic: Theory & Policy* (Ninth). Addison Wesley.

Mayasari, S. E., Budiono, B., & Ervani, E. (2021). ANALISIS PENGARUH ASEAN-CHINA FREE TRADE AREA (ACFTA) TERHADAP KINERJA EKSPOR INDUSTRI TEKSTIL DAN PRODUK TEKSTIL (TPT) INDONESIA. *Arena Tekstil*, *36*(2). https://doi.org/10.31266/at.v36i2.6474

Nurhayati, E., Hartoyo, S., & Mulatsih, S. (2019). Analisis Pengembangan Ekspor Pala, Lawang, dan Kapulaga Indonesia. *Jurnal Ekonomi Dan Pembangunan Indonesia*, *19*(2). https://doi.org/10.21002/jepi.v19i2.847

Rosyidi, S. (2001). *Pengantar Teori Ekonomi: Pendekatan Kepada Teori Ekonomi Mikro dan Makro*. Raja Grafindo.

Samuelson, P., Nordhaus, W., Gretta, & Sumaryati, M. (2004). *Ilmu Makro Ekonomi*. Media Global Edukasi.

Sari, K. R., & Widyastutik. (2015). FAKTOR YANG MEMPENGARUHI DAN ESTIMASI TARIF EKUIVALEN NTBs EKSPOR KAYU LAPIS INDONESIA. *Buletin Ilmiah Litbang Perdagangan*, *9 No 1*, 100.

Sebayang, K. D. (2011). Dampak Integrasi Ekonomi ASEAN Terhadap Perdagangan Indonesia Pada Sektor Kendaraan Roda Empa. *Econo Sains Universitas Negeri Jakarta*, *9*(2), 119–131.

Septiana, A. (2016). *PENGANTAR ILMU EKONOMI Dasar-Dasar Ekonomi Mikro & Ekonomi Makro*. Duta Media Publishing.

Susila, W. R. (2022). *Perdagangan Internasional Teori, Kebijakan, dan Terapan*. Prasetiya Mulya Publishing.

Syahfdi, O. F., Siregar, M. A., & Hamid, A. (2010). Analisis Permintaan Pasar Ekspor Terhadap Produk Udang Beku Indonesia. *AGRICA (Jurnal Agribisnis Sumatera Utara)*, *3*(2).

Todaro, M. P. (2001). *Pembangunan Ekonomi di Dunia Ketiga*. Erlangga.

Wahyudi, S. T., & Anggita, R. S. (2016). The Gravity Model of Indonesian Bilateral Trade. *International Journal of Social and Local Economic Governance*, *1*(2), 153–156. https://doi.org/10.21776/UB.IJLEG.2015.001.02.9

Wayan, N., Yanti, S. E., Sudirman, W., Pembangunan, J. E., Ekonomi, F., & Bisnis, D. (2017). PENGARUH KURS DOLLAR AMERIKA SERIKAT, INFLASI, DAN HARGA EKSPOR TERHADAP NILAI EKSPOR PAKAIAN JADI INDONESIA. *E-Journal Ekonomi Pembangunan Universitas Udayana*, *Vol 6*(Maret 2017).