

Competitiveness and Flow of Indonesian Paper Trade in The Global Market

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Abstract

Indonesia has the opportunity to increase the share of paper exports in the world due to the declining dominance of NORSCAN (North America and Scandinavia). The momentum is not only an opportunity for Indonesia, but also other paper exporters in Asia and Latin America. This research aims to analyze the competitiveness and determinants of Indonesia's paper trade flow using secondary data in 2001-2020 with 11 main export destination countries as objects using Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD) and Gravity models. The RCA analysis showed Indonesia's paper has competitiveness in 11 export destination countries with diverse growth rates. This is in line with Indonesia's paper market position as Rising Star in 5 countries which means that Indonesian paper commodities are in a market with high demand growth and market share. Gravity model estimates show that Indonesia and importers real GDP per capita, as well as the level of competitiveness positively affects Indonesia's paper exports, inversely, export prices and dummy Technical Barrier to Trade (TBT) give negative impact. Based on these results, efforts to increase exports should be done by promoting paper to market with Rising Star and large economies such as China and USA as the priority choices.

Keywords: EPD, Export, Gravity model, Panel data, RCA

JEL classification: F12, F13, F14, Q23

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1. Introduction

Paper is one of the potential export products from the forestry sector that contributes to the Indonesian economy. Indonesia's paper production

is supported by the availability of wood as raw materials from industrial forests plantation (Hutan Tanaman Industri-HTI) whose number of permits and extent are increased every year. HTI

concession area until 2018 covers 11.17 million Ha or a significant increase compared to HTI area in 1995 which only covered 1.13 million Ha (Asosiasi Pengusaha Hutan Indonesia, 2016; Forest Watch Indonesia, 2015; KLHK, 2018). The rapid development of HTI in Indonesia is closely related to the capacity of the pulp and paper industry that requires large raw materials (Forest Watch Indonesia, 2015). The expansion of HTI is also a strategic step to ensure the availability of paper industry raw materials due to backward linkage between HTI and the log industry as a producer of short fiber raw materials. This contributes to increasing paper production and exports every year and makes Indonesia one of the largest paper exporters in the world.

Based on data from 2001-2020 Indonesia is in 15th place for paper exporters in the world with an average export market share of 2.16% of the total world exports (Trade Map, 2021). Although world paper trade is dominated by North American countries (USA) and Scandinavian countries (Sweden, Finland and Norway) or commonly called NORSCAN (North America and Scandinavia), Indonesia still has the opportunity to expand its export market share due to the decline in the dominance of NORSCAN countries in world paper trade and shift to Asia especially Indonesia and Latin American countries such as Chile, Brazil and Uruguay (Departemen Perindustrian, 2009; Kementerian Perdagangan, 2019). One of the causes in shifting is that NORSCAN countries can

no longer develop the potential of raw materials significantly and the cost of paper production is relatively expensive (Departemen Perindustrian, 2009). The decline in the dominance of NORSCAN countries in the world paper trade can be seen from the growth in export value and negative market share that occurred in the USA, Canada, Sweden and Finland, whereas paper producing countries in Asia such as Indonesia and China still show growth in export value and positive market share (Table 1).

Decline of NORSCAN country dominance momentum became an opportunity for Indonesia to increase its role in world paper trade supported by comparative advantages related to raw materials because of higher productivity of wood-producing crops in Indonesia than others competitors in sub-tropical climates (Kementerian Perdagangan, 2019), and the presence of HTI as a supplier of raw materials. In terms of market potential, world paper consumption is expected to grow, especially those used for packaging and sanitary. Concerns over plastic packaging waste are an opportunity for the paper industry to create fiber-based packaging (Chauhan & Meena, 2021) so that it is expected to increase paper demand. Even the world's paper consumption in 2017 still grew by 1.21% with the largest consumption by countries in the Asian continent which became Indonesia's main export destination (FAO, 2019). However, this momentum is not only an opportunity for Indonesia but also other paper exporters in Asia and Latin America, creating competition between exporter countries.

Table 1. Growth in export value and market share of world paper exporters

Exporter's country	Export value growth (%)		Market share growth (%)	
	2001-2010	2011-2020	2001-2010	2011-2020
Germany	8.26	-2.98	1.76	-1.43
USA	4.53	-2.13	-1.65	-0.16
China	23.75	5.72	16.15	7.95
Canada	-1.82	-4.37	-7.61	-2.85
Sweden	6.30	-3.91	-0.12	-2.22
Finland	2.67	-4.36	-3.71	-2.82
France	4.35	-4.00	-2.09	-2.41
Italy	7.42	-1.86	0.84	-0.24
Netherland	6.02	-1.13	-0.47	0.46

Exporter's country	Export value growth (%)		Market share growth (%)	
	2001-2010	2011-2020	2001-2010	2011-2020
Austria	6.18	-2.40	-0.25	-0.66
Belgium	5.09	-3.43	-1.27	-1.95
Spain	9.61	-1.67	3.04	0.06
United Kingdom	2.74	-3.79	-3.22	-2.17
Poland	15.82	2.56	9.12	0.35
Indonesia	9.12	0.35	2.83	2.02

Source: (Trade Map, 2021) (processed)

The development of Indonesian paper exports in the last 20 years (2001-2020) fluctuates and is influenced by many factors. Indonesian paper is exported to various destination countries in Asia, America, Europe and Australia. Indonesia's export destination country has different characteristics both in terms of economy and geographical distance which becomes a pull factor (gravity) of paper trade flow from Indonesia to the export destination country. Domestic income and distance between the two trading partner countries play a major role in the occurrence of trade as stated by the Gravity model (Morland et al., 2020). The gravity model is one of the most commonly used analyzing trade approaches in modern econometrics and commonly used to test and also predict trade patterns between countries (Nasrullah et al., 2020). In fact, the gravity model can be viewed as the leading scientific model in the economics of international trade flows (Li et al., 2020; Yao et al., 2019). This model assumes that trade flows are directly proportional to the size of a country's economy and are inversely to distance due to transportation costs (Chaney, 2018; Wu et al., 2020). In addition to income and distance, there are other factors that affect a country's trade flows such as population, exchange rate, price, competitiveness, language similarity, infrastructure and trade cooperation relations (Darhyati et al., 2017; Ganbaatar et al., 2021; Li et al., 2020; Maulana & Kartiasih, 2017; Nasrullah et al., 2020; Nguyen, 2022; Nurhayati et al., 2018; Riyani et al., 2018; Shobande, 2019; Yemima & Novianti, 2020).

In an effort to increase exports in the world paper trade, competitiveness and determining

factors of Indonesia's paper trade flow to the destination country needs to be analyzed. The competitiveness of agricultural products (in the broad sense) is important to analyze because it is not only related to a country's capacity to export a product, but also to the sector sustainability (Long, 2021). How to improve the competitiveness of Indonesia's paper exports by paying attention to the sustainability of the forestry sector is an urgent practical issue for countries with large forestry sectors such as Indonesia. Simangunsong & Wulandari (2016) analyzed the competitiveness of Indonesian paper in the period 2002-2011. But the study only used a few paper products (Newsprint, Printing-writing paper, Other paperboard) and was conducted globally without analyzing competitiveness in each export destination country. Malau et al. (2021) analyzed the competitiveness of Indonesian paper exports but only focused on comparing the level of competitiveness between exporting countries. (Marina & Sri Multasih, 2016) analyzed factors that affect Indonesia's paper exports but are limited to Latin American countries only. On the other hand, Indonesia's main export destination countries are China, Japan, USA, Vietnam, Australia, Malaysia, Philippines, Singapore, Saudi Arabia, South Korea and Thailand with a total export share of $\pm 65\%$ of Indonesia's total paper exports (Trade Map, 2021).

This study has differences in object and scope of analysis using 11 major export destination countries with export share $\pm 65\%$ of Indonesia's total paper exports so it can properly describe Indonesia's paper trade flow. This study also analyzes export competitiveness in each export

destination country so that it can be determined by potential export countries as an effort to increase Indonesia's paper exports. Another difference is that this study analyzes the impact of non-tariff measures (NTMs) on Indonesian paper exports that have not been done by previous research. According to the (Kementerian Perdagangan, 2019), the rise of trade protectionism, the increasing trend of instruments in the form of non-tariff barriers and negative sentiment becomes an obstacle in the Indonesian paper industry. Indonesian paper is often associated with the issue of forest and land fires because its raw materials are supplied from HTI concessions. NTMs potentially have an economic impact on international trade through changes in the quantity of goods traded, prices or both (United Nations Conference on Trade and Development, 2010). Based on the description, the purpose of this study is to analyze competitiveness and factors that affect the flow of Indonesian paper trade in the main export destination country.

2. Research Method

This study uses secondary data from 2001-2020 with 11 major export destination countries as cross-section units. These 11 countries are Indonesia's largest export destinations with the largest average export volume within that period namely Japan, Malaysia, China, USA, Vietnam, Australia, Philippines, Singapore, Saudi Arabia, South Korea and Thailand. The paper analyzed is paper in aggregate with code HS 48 (Paper and paperboard; articles of paper pulp, of paper or of paperboard). The data used in this study is Indonesian paper export volume, paper export-import value, geographic distance, GDP real, nominal exchange rate, population, non-tariff measures (NTMs) and consumer price index obtained from several sources namely Trade Map, World Bank, UNCTAD, CEPII and I-TIP WTO.

Data analysis is done using three methods, namely Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD) and Gravity model. One of the indicators used to measure the country's commodities competitiveness in the global market is the RCA index introduced by Balassa (1965). The RCA index is an important

metric for evaluating a country's competitiveness in exporting certain commodities (Liu & Gao, 2022). This method has been widely used by various researchers to measure the level of country's commodity competitiveness such as Erokhin et al. (2020), Kuzmenko et al. (2022), Matkovski et al. (2022), Mizik et al. (2020), Vu et al. (2019), Wardani et al. (2018), and Yemima & Novianti (2020). RCA calculates competitiveness by comparing the share of exports of a commodity in the country's total exports with the share of the same commodity exports in total world exports (Kim, 2019). Mathematically RCA is formulated as follows (Mizik et al., 2020; Vu et al., 2019):

$$RCA_{ij} = \frac{X_{ij}/X_{it}}{W_{ij}/W_{it}}$$

Where:

RCA_{ij} = Country's competitiveness j over commodities i

X_{ij} = Commodity exports value of i from j countries (US \$)

X_{it} = Total export value of all J country commodities (US \$)

W_{ij} = Export value of i commodities from the world (US \$)

W_{it} = Total export value of all world commodities (US \$)

RCA values range from 0 to ∞ . shows that the country has competitiveness over a commodity and inversely, shows that the country does not have competitiveness over a commodity (Kim, 2019; Kuzmenko et al., 2022).

Export Product Dynamic (EPD) is used to identify a country's commodity competitiveness position for specific market purposes. This method also aims to find out the commodity performance, whether it has dynamic growth or not (Wardani et al., 2018). The competitiveness position is indicated by the combination of market share (the growth of a country's total export market share in the destination country) and product dynamics (growth in the export market share of a particular product of a country in the destination country) (Pinandhita

& Agustina, 2019). EPD analysis consists of a matrix that places products into 4 quadrants namely *Rising Star*, *Falling Star*, *Lost Opportunity* and *Retreat* (Esterhuizen, 2006).

Table 2. EPD market position matrix

Share of country's export in world trade	Share of trade product in world trade	
	Rising (dynamic)	Falling (stagnan)
Rising (competitive)	<i>Rising Star</i>	<i>Falling Star</i>
Falling (non-competitive)	<i>Lost Opportunity</i>	<i>Retreat</i>

Sources: (Esterhuizen, 2006; Yanti & Widyastutik, 2012)

The matrix consists of market attractiveness and business strength information. Market attractiveness is indicated by the growth in demand of a product for specific market purposes and business strength information obtained from market growth or market share (Madiah & Widyastutik, 2020). Mathematically EPD is formulated as follows (Esterhuizen, 2006):

x-axis: Export market share growth (Indonesia)

$$\frac{\sum_{t-1}^t \left(\frac{X_{ij}}{W_{ij}} \right)_t \times 100\% - \sum_{t-1}^t \left(\frac{X_{ij}}{W_{ij}} \right)_{t-1} \times 100\%}{T}$$

y-axis: Product market share growth (paper)

$$\frac{\sum_{t-1}^t \left(\frac{X_{ij}}{W_{ij}} \right)_t \times 100\% - \sum_{t-1}^t \left(\frac{X_{ij}}{W_{ij}} \right)_{t-1} \times 100\%}{T}$$

Where:

X_{ij} = Value of Indonesian paper exports to the country j year t (US \$)

X_t = Total value of Indonesia's exports to the country j year t (US \$)

W_{ij} = World paper export value to country j year t (US \$)

W_j = Total value of world export to country j in year t (US \$)

T = Number of observation period

The determining factors of Indonesia's paper trade flow to the main destination country were analyzed using gravity models. Gravity

models have been widely used as standards or benchmarks to measure and predict trade flows between countries (Nasrullah et al., 2020). Gravity model is the most popular quantitative method for estimating the flow of trade between countries (Baier et al., 2014; Nguyen, 2022) the two most important agricultural products, especially in exploring the role of "behind-the-border" constraints. Design/methodology/approach The paper applies the stochastic frontier gravity model, which models the aggregate effect of "behind-the-border" factors for Vietnam's export in rice and coffee. Findings The paper finds that the impact of "behind-the-border" constraints is statistically significant, suggesting that Vietnam's exports in rice and coffee may be prevented from reaching their export potential by such factors. Moreover, technical efficiency and potential export suggest that Vietnam has a lot of potential to increase its exports in rice and coffee with its major trading partners. The Association of Southeast Asian Nations group continues to be the major market of Vietnamese rice and coffee. Vietnam can also take advantage of the opportunity to export these commodities to the European Union (EU). Even gravity models can be viewed as leading scientific models in international trade flow economies (Li et al., 2020; Yao et al., 2019). According to the basic equation of gravity model, a country's economic strength (GDP) and geographical proximity (distance) are the two main variables that explain the flow of trade between trading partner countries (Shobande, 2019). The basic equation of the gravity model formulates that the GDP of exporters and importers has a positive impact on export volumes, whereas geographical distance has a negative impact (Wang et al., 2018). The basic formula of the gravity model can be seen as follows (Dumor & Yao, 2019):

$$T_{ij} = \alpha \frac{GDP_i^{\beta_1} - GDP_j^{\beta_2}}{D_{ij}}$$

Description

T_{ij} = Trade volume between country i (origin country) and j (destination country)

GDP_i = GDP of country i (origin country)

GDP_j = GDP of country j (destination country)

D_{ij} = Distance between countries i and j
 α, β = Estimated parameters

Gravity models used in international trade analysis have undergone many modifications. The development of gravity models in recent decades is becoming increasingly mature and forming into a common linear equation that is easy to use for empirical testing (Li et al., 2020). The advantage of this model is the ability to cover other variables that allegedly affect the trade relationship between the exporter and importer country (Bensassi et al., 2015). The gravity model used in the study refers to Buongiorno (2016), Das et al. (2018) and Dos Reis et al. (2020). The independent variables used are adoptions and modifications of some previous studies such as Sunardi et al. (2014), Sari & Widyastutik (2015) dan menghitung Nilai Tarif Ekuivalen dari Non Tariff Barriers (NTBs, Wardani et al. (2018), Madiyah & Widyastutik (2020), Nasrullah et al. (2020), Nguyen (2022) and Li et al. (2020). The study also added non-tariff measures (NTMs) as independent variables that allegedly affect the paper trade flow to export destination countries. NTMs in this study were limited to sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) policies because they are the most commonly enforced by importers in international markets. SPS and TBT variables use dummy variables, the same as Ardiyanti & Saputri (2018) this study uses gravity model with panel data. Variables used are export volume of Indonesia's shrimp and processed shrimp, GDP of export destination countries, real exchange rate, economic distance, import duty and NTM variables (SPS and TBT, Sari et al. (2014) and Wardani et al. (2018) research. The gravity model used in this study was formulated as follows:

$$\ln EXP_{ijt} = \beta_0 + \beta_1 \ln GDP X_{it} + \beta_2 \ln GDP I_{jt} + \beta_4 \ln PRC_{jt} + \beta_5 \ln DIST_{jt} + \beta_6 \ln RCA_{jt} + \beta_7 dSPS_{jt} + \beta_8 dTBT_{jt} + \varepsilon_{jt}$$

Where:

EXP_{it} = Indonesia's paper exports volume to j country in year t (Ton)

$GDP X_{it}$ = Indonesia's real GDP per capita in year t (US\$)

$GDP X_{jt}$ = Real GDP per capita country j in year t (US\$)

RER_{jt} = Real exchange rate in year t (Rp/LCU)

Calculation of real exchange rate is formulated as follows Sari et al. (2014):

$$RER_{jt} = \frac{CPI \text{ Country } j}{CPI \text{ Indonesia}} \times \frac{\text{Nominal exchange rate of Indonesia}}{\text{Nominal exchange rate of Country } i}$$

PRC_{jt} = Indonesia's paper export price in j country in year t (Ton/US\$)

Export price is the division between the value of exports to export volumes. Calculation of the price of Indonesian paper exports in export destination countries is formulated as follows:

$$PRC_{jt} = \frac{\text{Export value}}{\text{Export volume}}$$

$DIST_{jt}$ = Economic distance between Indonesia and country j (US\$)

Economic distance is used as a proxy for transportation costs incurred in trade transactions between countries separated by geographical distance. Calculation of economic distance refers to (Inayah et al., 2016):

$$DIST_{jt} = \text{Geographic distance between Indonesia and Country } j \times \frac{GDP \text{ of Country } j}{\sum GDP \text{ of Country } j}$$

RCA_{jt} = Indonesia's paper export competitiveness in j country (Index)

$dSPS_{jt}$ = dummy NTMs in the form of SPS policy of the country j over Indonesia. d=1, if there are SPS applied to the Indonesian paper and d=0 if no SPS policy applies

$dTBT_{jt}$ = dummy NTMs in the form of TBT policy of the country j over Indonesia. d=1, if

there are TBT applied to the Indonesian paper and d=0 if no TBT policy applies

β_0 = Intercept

β_1 - β_7 = Parameter to be estimated

$\ln$ = Natural logarithm

t = Time period (2001-2020)

i = Cross-section data of Indonesia

j = Cross-section data of export destination countries

ε = Error term

Estimation of the determinants in Indonesia's paper trade flow with gravity model is done using regression panel data. The use of panel data is considered relevant to the purpose and can provide precise information about the determining factors. The estimation is done using three approaches, namely Common Effects Model (CEM) or Pooled Least Squares (PLS), Fixed Effects Model (FEM) and Random Effects Model (REM) (Juanda, 2009). The selection of the right panel data regression model was conducted using the Chow test, Hausman Test and LM Test. The Chow test is used to choose between PLS or FEM, while The Hausman test is used to choose the best model between FEM or REM, and The LM test is used to choose between CEM or REM (Firdaus, 2011). The model also conducted classical assumption test, namely normality, multicollinearity, heteroskedasticity, and autocorrelation tests. Models that have fulfilled classical assumptions continue with t-test and F-tests. The t-test is performed to partially test the effect of independent variables on dependent variables, while the F-test is used to find out whether independent variables have a simultaneous influence on dependent variables.

3. Results and Discussion

3.1 Indonesia's Paper Exports Competitiveness in Major Destination Countries

Paper is a leading export commodity from forestry-based industries which importantly contributes to the Indonesian economy. Indonesian paper commodities have experienced a tremendous increase in terms of quality and creativity. supported by the advantages of raw materials supplied by Industrial Forests Plantation (HTI), Indonesian paper has been able to compete in the global market. Understanding the competitiveness of paper exports is important so that paper export development measures can be carried out more effectively and efficiently. The competitiveness of Indonesian paper exports was analyzed using the RCA index. The results showed that Indonesia's paper had competitiveness in 11 major export destination countries indicated by the $RCA > 1$ value. Matkovski et al. (2022) classified RCA values into 3 categories which is $RCA > 3$ states strong competitiveness, $3 < RCA \leq 2$ states significant competitiveness and $2 < RCA \leq 1$ states satisfactory competitiveness data. Based on the classification, it was concluded that Indonesian paper has strong competitiveness in 9 countries (Japan, Malaysia, China, Vietnam, Australia, Philippines, Saudi Arabia, South Korea and Thailand), while the rest is significant competitiveness in the USA and satisfactory competitiveness in Singapore. Highest competitiveness found in Saudi Arabia (7.23), Vietnam (6.22) and China (4.61), while the lowest competitiveness found in the Singapore market (1.94), the USA (2.15) and Thailand (3.11) (Table 1).

Table 1. Result of RCA analysis

Tahun	JPN	MLY	CHN	USA	VIE	AUS	FIL	SGP	ARB	KOR	THA
2001	3.86	7.32	4.66	1.63	4.38	3.59	4.64	2.75	7.15	3.63	3.74
2002	4.14	6.38	5.06	1.19	4.69	3.60	6.61	2.59	6.61	5.81	2.77
2003	3.68	5.95	4.87	1.16	4.53	3.77	4.05	2.38	6.29	4.66	3.22
2004	3.55	5.36	5.26	1.08	6.46	5.04	3.60	2.70	8.05	3.16	2.97
2005	3.51	5.27	3.92	1.08	6.26	3.75	3.79	2.55	8.18	2.27	3.57

Tahun	JPN	MLY	CHN	USA	VIE	AUS	FIL	SGP	ARB	KOR	THA
2006	3.37	5.83	4.52	1.94	5.91	3.78	4.43	3.15	7.79	2.62	3.35
2007	3.01	4.98	4.49	2.64	7.18	3.41	4.09	2.77	9.72	2.70	3.75
2008	3.44	4.25	4.37	2.40	7.12	3.37	4.52	2.87	8.28	2.16	3.64
2009	3.69	3.28	3.54	2.57	7.87	2.99	2.60	2.54	7.84	2.08	3.41
2010	3.46	3.09	3.74	2.23	8.39	2.71	2.52	2.26	10.66	1.95	3.28
2011	3.44	2.96	2.95	2.13	7.57	2.47	2.26	1.54	6.99	1.60	2.73
2012	4.28	2.96	2.61	2.75	7.73	2.84	2.48	1.54	5.98	1.71	3.04
2013	4.08	3.06	2.02	2.66	8.04	2.61	2.73	1.51	6.42	1.98	2.95
2014	3.99	3.21	2.95	3.71	7.44	2.17	2.90	1.34	5.84	2.27	2.28
2015	4.62	3.66	4.42	2.58	6.33	3.27	2.51	1.27	6.80	3.02	2.59
2016	4.53	3.19	3.93	2.19	4.94	3.92	2.10	0.97	5.71	2.84	2.62
2017	4.38	2.99	6.49	1.76	5.03	5.04	2.05	0.89	6.57	3.06	2.88
2018	4.66	3.30	7.71	2.13	5.28	4.14	2.79	0.99	8.07	3.89	2.92
2019	5.26	3.32	6.28	2.88	4.24	3.99	2.49	0.98	6.26	5.65	3.05
2020	5.51	3.12	8.49	2.26	4.98	4.75	3.12	1.20	5.38	6.22	3.41
Ave	4.02	4.17	4.61	2.15	6.22	3.56	3.31	1.94	7.23	3.16	3.11
Growth (%)	2.29	-3.92	6.10	4.98	1.68	3.18	0.33	-3.30	0.22	5.54	0.36

In line with this study finding, Marina & Sri Multasih (2016) research reported that Indonesian papers have competitiveness in 8 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala and Peru). Similar research by Malau et al. (2021) that aimed at comparing competitiveness levels between world paper exporters also reported that Indonesia has competitiveness over paper commodities even though it is lower than Finland. Other research by Betari (2020) also concluded that Indonesian paper has the highest competitiveness in China compared to 4 other competing countries, namely Japan, Thailand, Sweden and the United States.

The competitiveness value of Indonesian paper exports in 11 major destination countries fluctuates with varying trends. The growth of Indonesia's paper export competitiveness shows a positive trend in 9 countries while in Malaysia and Singapore the competitiveness of Indonesian paper tends to decrease. Even in 2016-2019, the RCA value in the Singapore market <1 which shows that Indonesia's paper was uncompetitive in that year. Indonesian paper has the highest competitiveness growth in China (6.10%), South

Korea (5.54%) and USA (4.98%). China became Indonesia's paper export market with the highest competitiveness and the highest competitiveness growth trend as well. This is because China is the highest paper consuming country in Asia and the second highest in the world after the USA. China's paper consumption in 2017 amounted to 410.9 million tons or a quarter of the world's total paper consumption (FAO, 2019).

South Korea is also the market with the highest level of competitiveness and competitiveness growth. Indonesia's paper exports to South Korea have increased again after an unproven anti-dumping allegation. Previously, Indonesian paper exports to South Korea were hit by anti-dumping allegations because they have competitive prices and quality so that it is considered to interfere with the sustainability of the paper industry in export destination countries that produce similar products. The covid-19 pandemic that hit the world also has an impact on the increasing need for sanitary paper (wipes) thus increasing Indonesia's paper exports to Japan, South Korea and China. This is seen from the competitiveness of Indonesia's exports in the

3 countries which increased significantly in 2020. Although the United States became one of the export markets with the highest competitiveness growth rate, Indonesia's paper exports to the country were faced with the implementation of a trade remedy policy, especially in coated paper (Amadea & Oktora, 2021).

Competitiveness analysis needs to be equipped with information about Indonesia's paper market position in the destination country so that it can be used as a basis for its development. Indonesia's paper market position in export destination countries is analyzed using Export Product Dynamic (EPD) and produces positions with diverse quadrants (Table 3). Most Indonesia's paper positions in the 11 countries analyzed were in the *Retreat* position followed by *Rising Star*. Research by Marina & Sri Multasih (2016) in 8 Latin American countries also reported that Indonesian papers are mostly in the *Retreat* and *Rising Star* positions. Different results were reported by Fahmi (2016) who concluded that Indonesia's paper position was mostly in the position of *Rising Star* and *Lost Opportunity* in 18 countries of the Organization of Islamic Cooperation (OIC).

Indonesian paper is in a *Retreat* position in Japan, Australia, Singapore, Saudi Arabia and South Korea. *Retreat* is an undesirable market position because the products have lost market share and are not dynamic products (Kusuma & Firdaus, 2015). This *Retreat* position indicates that the decline in Indonesia's paper export growth in 5 export destination countries (Japan, Australia, Singapore, Saudi Arabia and South Korea) was followed by a decrease in demand.

The decrease in demand for paper exports in Japan as a destination for Indonesia's main export destination is quite significant. Japanese paper imports in 2012 reached 4,227,346 US\$ and fell significantly to 2,858,314 US\$ in 2020 (Trade Map, 2021). The decrease in demand led to a decrease in Indonesia's export market share because it had to compete with other exporters in the Japanese market such as China and USA.

The *Retreat* position in Singapore and Saudi Arabian markets in line with the average low competitiveness growth compared to other destination countries of -3.30% and 0.22% respectively. In addition, Indonesia's paper exports to the two countries in the last 10 years (2011-2020) experienced a very large decline of -6.89 (Singapore) and -5.41% (Saudi Arabia) (Trade Map, 2021). Despite strong competitiveness with a high growth rate, Indonesia's paper exports in Japan and Australia turned out to be a retreat. The value of Indonesian paper exports to these countries in the last 20 years did show positive growth. But in the last 10 years (2011-2020), data showed the value of Indonesian paper exports actually decreased with a considerable percentage decline such as in Japan (-1.76%) and Australia (-2.56%) (Trade Map, 2021). The decline in exports to Japan is quite large because consumers have a high preference for the environment so it is necessary to be convinced that Indonesian paper is a product with raw materials derived from sustainable crop forests. Even in the South Korean and Australian markets, Indonesian papers have been hit by anti-dumping allegations, which has had an effect on declining exports.

Table 3. Result of EPD analysis

Export destination countries	EPD		Market position
	x-axis	y-axis	
Japan	-0.001262	-0.000786	<i>Retreat</i>
Malaysia	-0.002122	0.000940	<i>Lost Opportunity</i>
China	0.004457	0.000321	<i>Rising Star</i>
USA	0.000321	4.7631E-05	<i>Rising Star</i>
Vietnam	0.000355	-4.7442E-05	<i>Falling Star</i>
Australia	-0.002199	-0.000812	<i>Retreat</i>
Philippines	0.000473	0.002083	<i>Rising Star</i>

Export destination countries	EPD		Market position
	x-axis	y-axis	
Singapore	-0.004401	-0.000683	<i>Retreat</i>
Saudi Arabia	-0.003176	-0.000317	<i>Retreat</i>
South Korea	-0.000519	-0.000641	<i>Retreat</i>
Thailand	0.000969	0.000367	<i>Rising Star</i>

Indonesia's paper exports in Malaysia are in a *Lost Opportunity* position that means the growth of paper demand in the country is still increasing but export growth from Indonesia is decreasing. Through the lost opportunity position, it can be known the weakness of paper commodities, actions that must be taken to overcome these weaknesses as well as the main competitors who are superior (Kanaya & Firdaus, 2014) Export Product Dynamics (EPD). This position also indicates that more Malaysian imports come from other exporters than Indonesia. Indonesia's paper exports to Malaysia in the last 10 years (2011-2020) have decreased significantly by -3.74% per year (Trade Map, 2021). Indonesia was originally the largest exporter of paper for the Malaysian market with an export share of 19.3% of the total paper imported by Malaysia in 2001. Indonesia's position as the largest paper exporter in the Malaysian market has been replaced by China with an export share of 26.6% in 2020, while Indonesia's export share fell significantly to 13.9% (Trade Map, 2021). The *Lost Opportunity* market position is actually still relatively good because Indonesia's paper demand in Malaysia is still increasing, but Indonesia must compete with other exporters in meeting the demand. Therefore, Indonesia needs to find a strategy to meet the export demand.

Indonesia's paper exports in Vietnam is in the *Falling Star* position that indicates an increasing export market share but the product is not dynamic (Kusuma & Firdaus, 2015). The value of Vietnamese paper exports from around the world in recent years has been relatively stable or not dynamic. China, South Korea, Japan, Thailand and Indonesia are the main exporters of paper commodities for the Vietnamese market with a $\pm$ export share of 70%. Indonesia's paper export share in Vietnam increased significantly to 17.7%

in 2011 or much larger than the export share in 2001 which was only 8.4% (Trade Map, 2021). Although still larger than the share of exports in 2001, currently Indonesian paper exports share in the Vietnamese market decreased to only 9.1%.

Indonesia's paper market in China, United States, Philippines and Thailand are in a *Rising Star* position. This position is more ideal than the previous 3 positions marked by additional market share for fast moving products (Sunardi et al., 2014). This position also indicates that the increase in paper demand in the three countries was followed by an increase in Indonesia's export share. The demand for paper in China increased significantly as demonstrated by the huge increase in the value of paper exports. The value of China's paper exports in 2020 reached 7,288,755 US\$, a significant increase compared to the export value in 2001 which was only 3,649,500 US\$ (Trade Map, 2021). This increase can be utilized by Indonesia, so that it becomes the exporter with the largest market share. Indonesia's paper export share increased to 14.11% in 2020 or greater than the export share in 2001 which was only 6.8%. Not much different from the Chinese market, the increase in paper demand by the United States can also be utilized by Indonesia so that Indonesia's export share increases to 2.2% in 2020 (Trade Map, 2021). Although not the largest exporter of paper to the Philippines, the increase in paper import value can be utilized by Indonesia by managing to increase its export share to 16.6% in 2020, a significant increase when compared to the export share in 2001 which was only 10.5%.

3.2 Determinant of Indonesia's Paper Trade Flow in the Major Destination Country

Determinants of Indonesian paper trade flow in the destination country were analyzed using regression panel data with three approaches

namely Common Effect Model (CEM) or Pooled Least Square (PLS), Fixed Effect Model (FEM) and Random Effect Model (REM). The selection of the best model among the three approaches was conducted using the Chow test, Hausman test and LM test. Chow's test results showed a probability value smaller than the significance level of 5% ($0.0000 < 0.005$) and obtained that FEM was better than PLS. Hausman's test results showed an invalid probability value (1.0000) caused by one of the independent variables used not qualifying for the random effect. This condition occurs because the E-views software automatically rejects the Hausman test if there are variables that do not meet the random effect requirements (Hendra & Hartomo, 2017). In conclusion, FEM is the best model for this study.

To produce the Best Linear Unbiased Estimator (BLUE) model, we conducted classical assumptions tested namely normality,

multicollinearity, heteroskedasticity and autocorrelation. The normality test is checked through Jarque-Bera probability values to ensure that errors in the data spread normally. Jarque-Bera's probability value of 0.09691 or greater than the significance level of 5% meaning that the model has met the assumption of normality. Multicollinearity tests are used to ensure there is no perfect linear relationship between independent variables examined through correlations between independent variables. The value of correlation between independent variables < 0.8 meaning that there is no perfect correlation between independent variables. To overcome heteroskedasticity and autocorrelation deviations, we weighted on the Fixed Effect Model using a SUR cross-section that is able to correct heteroskedasticity and autocorrelation between cross-section units (Mubarokah & Nurhayati, 2020; Nurhayati et al., 2018).

Table 4. Selection of the best model

Type of test	Probability	Decision
Chow test	0,0000**	FEM
Hausman test	1,0000	FEM

Note: **) Significant at 5% level

Table 5. Result estimation of panel data analysis

Variable	Coefficient	Probability
Indonesia real GDP per capita	0.168097	0.0000**
Importir real GDP per capita	0.454571	0.0032**
Real exchange rate	0.104218	0.7290
Export price	-0.969740	0.0000**
Economic distance	0.104218	0.4010
Competitiveness	0.716949	0.0000**
Dummy SPS	0.017125	0.5123
Dummy TBT	-0.105796	0.0000**
C	4.765561	0.0000**
R-squared		0.981005
Adjusted R-squared		0.979304
Probability (F-statistic)		0.000000

Note: **) Significant at 5% level

The F-test results show a probability value smaller than the significance level of 5% ($0.0000 < 0.05$) so that it is concluded that the model is worth using or there is at least one significant independent variable. The R-Squared value obtained amounted to 0.9810, meaning that the model built was able to explain the diversity of Indonesian paper trade flow by 98.10% while the rest was explained by other variables that were not included in the model. The results of the t-test showed that there are 5 independent variables that significant affect Indonesia's paper trade flow, namely Real GDP per capita Indonesia, Real GDP per capita importer, export price, competitiveness and dummy TBT (Table 5).

Indonesia's real GDP per capita variable as an exporter has a positive and significant effect on Indonesia's paper exports with a coefficient of 0.1680. It means that a 1% increase in Indonesia's real GDP will increase Indonesia's paper exports by 0.1680%, *ceteris paribus*. Suryana et al. (2014) stated that the increase in GDP of the exporter country will increase production volume, production capacity and purchasing power so as to have an impact on increasing the country's export volume. GDP per capita must be viewed in terms of growth compared to the size of the country so that countries with high GDP per capita growth have high purchasing power capabilities as well. Indonesia's average GDP per capita growth in 2001-2020 is quite high at 9.58% per year (World Bank, 2021). This is in line with Indonesia's paper exports which also grew by 4.46% per year (Trade Map, 2021). The results of this study are in line with Suryana et al. (2014) and Darhyati et al. (2017) that conclude the positive impact of GDP per capita on export.

In line with the exporter real GDP per capita, the variable real GDP per capita of the importing country also has a positive and significant effect on Indonesia's paper exports. This variable has a coefficient of 0.4545, meaning that a 1% increase in real GDP per capita of importer countries will have an impact on increasing Indonesia's paper exports by 0.4545%, *ceteris paribus*. GDP per capita describes the purchasing power and level of welfare of a country's people so that an increase in GDP per capita will also encourage an increase in

the purchasing power and consumption of people in the country, including for paper commodities. The increase in purchasing power will also increase the volume of Indonesian paper exports to the importer country. This is evidenced by the increase in exports that occurred in countries with the highest real GDP growth rate per capita in the period 2001-2020 such as China (13.72%), USA (3.72%) and the Philippines (8.56%) (World Bank, 2021). Indonesian paper exports volume to the three countries increased by 15.86% (China), 6.06% (USA) and 10.15% (Philippines) (Trade Map, 2021). These results reinforce previous studies that found the positive influence of real GDP per capita of importing countries on exports such as Tristi et al. (2021), Madih & Widyastutik (2020), Mubarakah & Nurhayati (2020), Wardani et al. (2018), Khaliqi et al. (2018), Darhyati et al. (2017), Suryana et al. (2014) and Meiri et al. (2013).

Export price as on variable tested show negative and significant effect on Indonesian paper exports with a coefficient of -0.9697. This means that the 1% increase in export prices will cause falling in Indonesian paper by 0.9697%, *ceteris paribus*. These results are in accordance with the law of demand which states that prices and requests are negatively related. Price increases will affect people's purchasing power which has an impact on decreasing the number of goods demanded by consumers. The variable coefficient of export prices shows that Indonesian paper is an elastic product so that policies to lower prices actually cause a decrease in receipts of paper commodity exports. Therefore, the stability of Indonesia's paper export prices needs to be maintained so that Indonesian paper exports can compete. Some previous studies such as Mubarakah & Nurhayati (2020), Nurhayati et al. (2018), Maulana & Kartiasih (2017) and Kusuma & Firdaus (2015) also concluded that price give negative impact on export.

The competitiveness variable (RCA) has a positive effect on Indonesia's paper exports. The coefficient of competitiveness variables of 0.7169, meaning that Indonesia's 1% increase in competitiveness will have an impact on increasing Indonesia's paper exports by 0.7169%,

ceteris paribus. Competitiveness is an important factor that a country must have in order to produce competitive goods in the international market. Export competitiveness reflects a commodity's ability to enter and survive in international markets. The positive influence of competitiveness implies that increasing the competitiveness of Indonesian paper will increase the volume of Indonesian paper exports to the destination country. Increased competitiveness makes demand for Indonesian paper increase by consumers so that the volume of Indonesian paper exports increases too. This research is in line with Yemima & Novianti (2020) and Maulana & Kartiasih (2017) which concluded the positive influence of competitiveness on exports.

Technical Barrier to Trade (TBT) dummy variable, negatively and significantly affects Indonesian paper exports with a coefficient of -0.1057. This means that the volume of Indonesian paper exports to destination countries that implement TBT policies is smaller than countries that do not implement TBT policies with a difference of 0.1057%, ceteris paribus. In line with the results of this study, the implementation of TBT policy by importer countries has an impact on the decline in Indonesian shrimp exports by 0.4 thousand tons (Ardiyanti & Saputri, 2018) this study uses gravity model with panel data. Variables used are export volume of Indonesia's shrimp and processed shrimp, GDP of export destination countries, real exchange rate, economic distance, import duty and NTM variables (SPS and TBT. In CPO commodities, the application of TBT by importing countries also caused Indonesia's CPO exports to fall by 0.4% (Sari et al., 2014). The negative coefficient of TBT dummy variables implies that the TBT policy implemented by the importing country becomes an obstacle to Indonesia's paper exports. This result also indirectly confirms that Indonesia has not been able to meet the standards and rules imposed by importers. Developed countries generally implement NTMs more strictly than developing countries (Darhyati et al., 2017) due to higher levels of consumer awareness towards product safety and environmental sustainability in developed countries. Countries that implement

more NTMs are the United States (32 policies consisting of 3 SPS and 29 TBT), China (26 Policies consisting of 5 SPS and 21 TBT) and South Korea (25 policies consisting of 1 SPS and 24 TBT). This fact also explains why SPS policy does not have a significant influence on paper exports because of its very small number of applications.

NTMs are not common compared to tariff barriers but NTMs can produce an equal or even greater aggregate impact on trade (Sun et al., 2010). TBT policies implemented by the importing country include processing, labeling, packaging production, production and post-production requirements, transportation and storage, production quality or TBT performance and measurement requirements. The results of this study reinforce some previous studies that concluded the negative influence of TBT policies on exports such as Tristi et al. (2021), Ardiyanti & Saputri (2018), Darhyati et al. (2017) and Sari et al. (2014). In addition to producing products safe and meeting environmental sustainability aspects, the application of TBT is also used as a protectionism practice to protect domestic products from international trade flows. Wood et al. (2019) stated that China's TBT policy has proven to reduce manufacturing exports and total overall exports of Japan and South Korea to the country. This was done to protect China's burgeoning industrial sector from competitive Japanese and South Korean export commodities.

The economic distance variable as the main model gravity does not have a significant effect on Indonesia's paper exports with a positive marked coefficient. Economic distance is used as a proxy for the costs to conduct bilateral trade between countries. Trading costs are an important factor that contributes to the product's pricing, so that the increase in trading costs will lead to an increase in the product price. Under the law of demand, the increase in the product price will be responded to by a decrease in the number of products requested. Therefore, the greater economic distance should lead to a decrease in the volume of Indonesian paper exports. But the different results in this study can be explained by the condition that paper exporter countries in the Asian continent are quite dominant, limited to 2 countries namely China and Indonesia (Trade

Map, 2021), so that other Asian countries do not have many choices. Moreover, Indonesian paper is supported by comparative advantage in terms of raw materials that causes competitive prices with other exporter countries. Therefore, the difference in economic distance or trade costs is presumed to be compensated by the difference in Indonesia's paper price with other exporter countries so that the importer country continues to export paper from Indonesia despite having greater costs. The positive influence of economic distance or trade costs on exports is also summed up by other studies such as Meiri et al. (2013) and Khaliqi et al. (2018).

4. Conclusions

Based on the results of the study, it concluded that Indonesia's paper has competitiveness in 11 export destination countries indicated by the value of $RCA > 1$. Indonesian paper has strong competitiveness in 9 countries while in USA it is significantly competitiveness and in Singapore it is satisfactorily competitiveness. In addition, the competitiveness of Indonesian paper exports also showed a positive trend in 9 countries and only decreased in Malaysia and Singapore. The high level of competitiveness and competitiveness growth is in line with Indonesia's paper market position in that country. Indonesian paper in China, United States, Philippines and Thailand is in a rising star position which means that Indonesian paper is in a market with high growth of demand and market share. These results also imply that the country is a potential market for increased Indonesian paper exports.

The results of gravity model estimation in this study show that the economic size projected through GDP per capita corresponds to the basic theory of gravity model, while the economic distance is not appropriate even though the effect is not significant. The gravity model results imply that Indonesia's paper trade flows are increasing due to the increase in the economy of export destination countries. Therefore, the promotion of paper to high economical countries would be better to increase Indonesia's paper exports. The RCA index increases Indonesia's paper exports, so increasing exports to high competitiveness

countries can be an alternative. The application of TBT can cause a decrease Indonesia's paper exports, so that the product should be pursued to meet the standards and regulations applied by importing countries, especially developed countries. The study also concluded that rising export prices could lower the number of Indonesian paper exports. Because Indonesian paper is an inelastic commodity, Indonesian paper prices also need to be maintained stability.

This study has comprehensively analyzed Indonesia's paper trade consisting of competitiveness, export market position, and factors that affect export flows. The research object consisting of 11 export destination countries is expected to describe Indonesia's paper export flow because it covers $\pm 65\%$ of the export market share. Factors affecting Indonesia's paper trading flow have included Variable Non-Tariff Measures (NTMs) namely SPS and TBT. This study has limitations on model formulation because SPS and TBT still use dummy variables. Further research is expected to use other approaches in calculating Non-Tariff Measures (NTMs) and using variables other than SPS and TBT.

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