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Measuring the Competitiveness and Efficiency of Indonesian Non-Oil and Gas Exports to Non-Traditional Markets

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Abstract

In order to improve the performance of the trade balance, Indonesia is currently always trying to diversify the market through the expansion of export markets to non-traditional countries. For this reason, measuring competitiveness and export efficiency is crucial to be researched first. This study aims to measure the competitiveness and efficiency of Indonesia's Non-Oil and Gas Exports to Non-Traditional Markets period 2016 to 2021 by using the analysis methods RCA, EPD, X-Model and Stochastic Frontier Analysis with Gravity Model (SFGM). The results of the analysis show that based on the results of the competitiveness analysis (RCA) and export performance using EPD and X-Model, it shows that the competitiveness of Indonesia's non-oil and gas exports to non-traditional countries is still low or below global competitiveness. Meanwhile, the results of estimation using the Stochastic Frontier Analysis approach with the Gravity Model (SFGM) show that the variables of GDP of non-traditional countries, the number of population of non-traditional countries, Indonesia's GDP, competitiveness (RCA) and the area of non-traditional countries have a positive and significant effect on Indonesia's exports. Meanwhile, economic distance is estimated to have a negative and significant influence on Indonesia's non-oil and gas exports.

Keywords: Competitiveness, Export Determinant, Non-Traditional Markets.

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INTRODUCTION

Indonesia is one of the countries that is open to trade cooperation with other countries. Indonesia's involvement and openness in trade cooperation is expected to strengthen the economy through improving export performance both to the world market and to partner countries (Hotsawadi and Widyastutik, 2020). On the other hand, the commitment to establish trade cooperation with other countries is also expected to expand employment, improve economic quality, accelerate technology transfer, and increase state revenue which contributes to improving the country's economy (Oktaviani & Novianti, 2014).

The non-oil and gas sector is a mainstay sector for Indonesia. This is strengthened by the component of Indonesia's trade balance where the non-oil and gas sector contributes 40.63% to Indonesia's total exports during the period 2019 to 2023. Indonesia's trade balance in the non-oil and gas sector was also identified as consistently experiencing a surplus during the period from 2019 to 2023. Based on this description, the results of research conducted by Harahap & Widyastutik, (2020) also stated that the non-oil and gas sector is the prima donna sector for Indonesia's trade because the sector is the supporting sector for Indonesia's trade balance.

One of the factors that affects the value of Indonesia's exports is import demand from trading partner countries. Indonesia trade will occur when there is a price disparity between the two countries, and excess supply in that country will be an export component while excess demand in other countries will be an import component. The top ten countries including the classification of Indonesia's main trading partners in the non-oil and gas sector during the period 2016-2021 are China, the United States, Japan, the European Union, Singapore, India, Malaysia, South Korea, the Philippines, and Thailand (WITS, 2022) . Indonesia's total export market share during the period 2016-2020 to the ten main trading partner countries was 78.84 percent. Referring to Harahap & Widyastutik, (2020), the ten main trading partner countries of Indonesia are classified as traditional markets. Thus, the situation still shows a pattern of Indonesia's trade dependence on traditional countries. High export dependence will provide vulnerability to Indonesia's trade balance, when major trading partner countries face shocks. Indonesia uncertainty, shocks to the economy, and external and internal problems faced by major trading partner countries will hamper Indonesia's trade performance (Oktaviani & Novianti, 2014). Thus, the market expansion strategy or export market diversification is a crucial goal

https://doi.org/10.70836/jh.v9i2.58

for the current government to anticipate the negative impact of the pattern of trade dependence on traditional countries.

Export market diversification is a strategy carried out by a country to expand the export market to new partner countries that have been identified as having not made trade cooperation commitments both bilaterally, regionally and multilaterally. This strategy is an effort that can be made to increase the volume and value of Indonesia's exports in the long term (Hadiyanto, 2015). Market diversification is also included in the Ministry of Trade's strategic plan in the 2020 to 2024 RPJMN. In this case, the government seeks to work on trade opportunities to the traditional market while maintaining Indonesia's trade performance to the traditional market.

Several previous studies have analyzed the diversification of Indonesia's exports to non-traditional markets, including research conducted by Sabaruddin, (2017), Harahap & Widyastutik, (2020). These studies carry out clustering methods to determine and define the meaning and definition of traditional and non-traditional countries. The results of the study define that traditional countries are countries that for 30 to 40 years have consistently been ranked in the top 15 export destinations of Indonesia. Meanwhile, non-traditional countries are countries that are inconsistently ranked in the top 15 export destinations for Indonesia for a period of 30 to 40 years.

Base on perspective of the scope of non-traditional countries, Harahap & Widyastutik (2020) found that there are 111 countries that are categorized as non-traditional export market destinations for Indonesia. These countries are spread across different regions of the world such as North and South America (e.g. Canada, Venezuela, Brazil, and Suriname), Europe (such as Switzerland, Albania, and Ukraine) and Africa (including Egypt, Nigeria, Ghana, Mozambique, and Central Africa). In addition, countries in Asia and the Middle East are also included in this category, such as Myanmar, Sri Lanka, Bangladesh, Oman, Yemen, and Qatar. The Oceania and Pacific Islands region is also represented by countries such as Fiji, Papua New Guinea, Vanuatu, and the Solomon Islands. The designation of these countries as non-traditional markets reflects the potential for diversification of export destinations to reduce dependence on traditional markets, expand the reach of global trade, and increase product competitiveness in the international arena (Harahap & Widyastutik, 2020; Sabaruddin, 2017; Oktaviani & Drynan, 2000).

https://doi.org/10.70836/jh.v9i2.58

In more detail, the research conducted by Harahap & Widyastutik, (2020) also uses the Structural Match Index (SMI) and Demand Index (DI) approaches to examine the opportunities and potential of non-traditional countries as a new target market for Indonesia's non-oil and gas products. The Structural Match Index (SMI) method is an approach taken to analyze the compatibility between Indonesia's exports and imports from non-traditional countries. Meanwhile, the Demand Index (DI) method is an approach taken to examine import demand opportunities from non-traditional countries for exports originating from Indonesia. The higher the value of the SMI index, the lower the level of compatibility of Indonesia's non-oil and gas exports with imports from non-traditional countries, while the higher the value of the DI index, the higher the potential demand of the country for imported products from Indonesia.

The merger between the results of the calculation of the Structural Match Index (SMI) and the Demand Index (DI) obtained four positions of opportunities and export potential for Indonesia with non-traditional countries. Quadrant I is a group of non-traditional countries that are identified as having a high SMI value and a high demand index, meaning that the level of compatibility between Indonesia's non-oil and gas exports and traditional country imports is low, but the position of import demand in the non-oil and gas sector is high for exports from the world. Quadrant II shows a condition where the SMI index value is low while the DI value is high. This position indicates that there is a compatibility between Indonesia's non-oil and gas exports and imports from non-traditional countries, and import demand from non-traditional countries is also high for non-oil and gas products from the world, including Indonesia. Benchmark III is a position where non-traditional countries are identified as having a low SMI index value while a high DI value. This fact indicates that Indonesia's non-oil and gas exports are compatible with imports from non-traditional countries. However, the import demand tends to be low for non-oil and gas products from Indonesia. Finally, quadrant IV classifies countries with high SMI and low DI index values. This means that the level of compatibility between Indonesia's non-oil and gas exports and traditional country imports is low and import demand from these countries is low.

Non-traditional countries in quadrant II are potential countries as a new market for Indonesia's trade. The country's opportunities and potential as a new market are reflected in the position where the SMI index value is low while the DI value is high, which indicates that there is a match between Indonesia's non-oil and gas exports

https://doi.org/10.70836/jh.v9i2.58

and imports from non-traditional countries, as well as the import demand of these countries is also high for non-oil and gas products from the world, including Indonesia. Countries in Quadrant III also still have the potential to be used as new target markets for Indonesia's trade. This is because the country is identified as having a low SMI score and a high DI value. The low SMI Index and high DI provide the fact that Indonesia's non-oil and gas exports are compatible with the non-oil and gas imports of these countries, but the import demand is relatively low for non-oil and gas products originating from Indonesia. There are 39 countries included in the quadrant III classification of the SMI and DI indexes, namely Albania, Angola, Cameroon, Chile, Colombia, Congo, Rep., Costa Rica, Dominican Republic, Ecuador, Fiji, Ghana, Guatemala, Jordan, Kenya, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Montenegro, Morocco, Mozambique, Namibia, Nepal, Nicaragua, Niger, Paraguay, Peru, Rwanda, Senegal, Seychelles, South Africa, Sri Lanka, Tajikistan, Tanzania, Togo, Tunisia, Uganda dan Ukraine (Harahap & Widyastutik, 2020).

The relatively low demand for non-oil and gas imports from these countries can be caused by the situation where these countries have obtained export supplies from other countries, especially countries that are their permanent partners. Several factors such as the existence of trade agreements with other countries, the quality and price of goods that are more competitive than other countries, as well as stronger diplomatic and economic relations are the reasons why the country supplies non-oil and gas products from other countries (Ingot & Ulfa, 2023). The import preferences of these countries are often influenced by factors such as lower tariffs, free trade agreements, as well as strategies for diversifying import sources to reduce dependence on a single country (Head & Mayer, 2004; Krugman et al., 2018). Thus, Indonesia needs to increase the competitiveness of its products and strengthen international trade relations to increase the demand for its non-oil and gas imports.

The measurement of the competitiveness and efficiency of Indonesia's non-oil and gas exports to non-traditional markets is carried out to determine the position of Indonesia's non-oil and gas products in these countries. This is in line with research conducted by Hotsawadi & Widyastutik (2023) which states that competitiveness analysis using the Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD) and X-Model methods is a strategic step that can be taken to determine how Indonesia positions itself in

https://doi.org/10.70836/jh.v9i2.58

improving trade performance and optimizing the benefits of trade cooperation with other countries. The analysis of the competitiveness and efficiency of Indonesia's non-oil and gas exports in traditional markets was carried out from the period 2016 to 2021 using the 2-Digit SITC approach. In this case, trade publication data with the 2-Digit SITC approach has the latest data until 2021. On the other hand, export efficiency analysis is also important to be carried out as a recommendation and consideration for the government in optimizing the performance of Indonesia's non-oil and gas export trade in traditional countries. Export efficiency analysis is one of the important aspects in a country's trade sector. This is because the measurement of export efficiency has an important role for the government in determining the competitiveness of its products in export destination countries and is expected to be a stimulus and consideration that can encourage an increase in the value and volume of exports in the international market (Fitriani, 2019).

Research related to export efficiency was conducted by Alim, (2019), Ravishankar & M. Stack (2014) to measure how optimally a country utilizes its economic potential in export activities. The method used, namely the Stochastic Forecast Gravity Model (SFGM) was used. The method combines a gravitational model, which evaluates trade flows based on factors such as economic size and distance between countries, with a stochastic component that captures random variability in the data.

However, research related to the measurement of the competitiveness and efficiency of Indonesia's non-oil and gas exports to non-traditional countries, which are included in the quadrant III classification using the SMI and DI index approaches, has never been conducted. By conducting a granular/detailed analysis of the development of the export performance of these superior products, both in terms of RCA, EPD, X-Model and export efficiency with the SFGM approach, it is hoped that it can be an illustration for the government to set a strategy and direction for trade policies that will be carried out to optimize and maximize these countries as targets for the expansion or diversification of new export markets for Indonesia's non-oil and gas sector.

THEORETICAL FRAMEWORK

The measurement of Indonesia's non-oil and gas export capacity to non-traditional markets was analyzed using the Revealed.

Comparative Advantage (RCA), Export Product Dynamic (EPD) and X-Model methods. In this case, the Comparative

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Advantage (RCA) method is used to measure or identify the competitiveness position of Indonesia's non-oil and gas exports in the world in each non-traditional country. Meanwhile, the Export Product Dynamic (EPD) and X-Model analysis methods are used to identify Indonesia's non-oil and gas export performance in each non-traditional country.

To identify the competitiveness and performance of Indonesia's non-oil and gas exports to non-traditional countries using the 2-Digit SITC approach except for the SITC code 33 and 34 classifications sourced from the World Integrated Trade Solution (WITS). This refers to research conducted by (Harahap & Widyastutik, 2020) where Petroleum and petroleum products (STIC 33) and Gas, natural and manufactured (STIC 34) products are included in the oil and gas sector classification.

Thus, the products classified as non-oil and gas sectors include live animals (00); Meat and processed meat (01); Dairy and egg products (02); Fish and processed fish (03); Cereals and processed cereals (04); Fruits and vegetables (05); Sugar, processed sugar and honey (06); Coffee, tea, cocoa, spices & manufacturing (07); Animal feed except milk (08); Other processed foods (09); Beverages (11); Tobacco and tobacco products (12); Skins, animal skins and fur skins, skinless (21); Oilseeds, oilseeds and oilseeds (22); Raw rubber (23) includes synthetic rubber and natural rubber; Timber, wooden beams and corks (24); Pulp and paper (25); (26) Textile fibers, not manufactured; Crude fertilizers and raw minerals (27); Metal ore and metal scrap (28); Raw animal and vegetable materials (29); Coal, coke and briquettes (32); Oils and animal fats (41); Fixed vegetable oils and fats (42); Animal and vegetable oils and fats (43); Chemical elements and compounds (51); Crude chemicals from coal, petroleum (52); Dyes, tanning and dyeing materials (53); Drug and pharmaceutical products (54); Fragrances, toilets & cleaners (55); Fertilizer, artificial (56); Explosives and pyrotechnic products (57); Plastic materials, etc. (58); Chemical materials and products (59); Manufacturing of leather, antiques, etc. (61); Rubber manufacturing, etc. (62); Wood and cork manufacturing is not included (63); Paper, cardboard and manufacturing (64); Textile yarn, fabric, finished goods (65); Non-metallic minerals manufacturing (66); Iron and steel (67); Non-ferrous metals (68); Metal manufacturing, etc. (69); Machinery, other than electric (71); Electrical machinery, equipment and equipment (72); Transportation equipment (73); Sanitation, piping, heating and lighting (81); Furniture (82); Travel goods, handbags and the like

https://doi.org/10.70836/jh.v9i2.58

(83); Clothing (84); footwear (85); Scientific & control tools, photography (86); Miscellaneous manufactured goods (89); Special transactions that do not belong to groups (93); Animals, excluding other groups, including zoo animals (94); Firearms of war and ammunition (95); and Coins, other than gold coins, not coins (96).

After measuring the competitiveness and performance of Indonesia's non-oil and gas exports in each non-traditional country, an analysis of export efficiency and factors affecting it was continued. The analysis of export efficiency and its determinants uses the Stochastic Frontier Analysis Gravity Model (SFGM) method. The Stochastic Frontier Analysis Gravity Model (SFGM) method is an analysis method that integrates the concepts of Stochastic Frontier Analysis (SFA) and Gravity Model to understand the relationship between a country's economic efficiency and trade interactions with other countries. In this case, the variables used in the SFGM model include the bound variable is the export value while the independent variables are Indonesia's Real GDP, Real GDP of trading partners, number of population, economic distance, real exchange rate, RCA index, area of each non-traditional country and Dummy FTA sourced from the World Bank, WITS, Herritage and CEPII.

The stages carried out in this study are as follows:

1. The measurement of the competitiveness of Indonesia's non- oil and gas exports to each non- traditional country classified as quadrant III according to the research of Harahap & Widyastutik, (2020) using the Revealed Comparative Advantage (RCA) 246uet o246c method. Indonesia's non-oil and gas exports to each non-traditional country use the two-digit SITC classification approach from 2016 to 2021 as described above.
2. The identification of Indonesia's non- oil and gas export performance to each non-traditional country was analyzed using the Product Dynamic (EPD) and X-Model methods. The Product Dynamic (EPD) and X-Model methods are quantitative methods that can be used to identify and measure the position of Indonesia's market dynamics and development to each non-traditional country.

After measuring the competitiveness and performance of Indonesia's non-oil and gas exports in each non-traditional country, the analysis of export efficiency and factors affecting Indonesia's non-oil and gas exports was continued using the Stochastic Frontier Analysis Gravity Model (SFGM) method.

https://doi.org/10.70836/jh.v9i2.58

This analysis aims to analyze how efficient Indonesia's non-oil and gas exports are in each non-traditional country and what factor have the potential to influence in encouraging Indonesia's non-oil and gas exports to each of these countries.

RESEARCH METHOD

The measurement of Indonesia's non-oil and gas export capacity to non-traditional markets was analyzed using the Revealed Comparative Advantage (RCA), Export Product Dynamic (EPD) and X-Model methods. After measuring the competitiveness and performance of Indonesia's non-oil and gas exports in each non-traditional country, an analysis of export efficiency and factors affecting it was continued. The analysis of export efficiency and its determinants uses the Stochastic Frontier Analysis Gravity Model (SFGM) method.

Revealed Comparative Advantage (RCA)

The RCA Index is a method that can be used to identify the comparative advantage or export competitiveness of a country in a commodity to the world. From another perspective, this study aims to measure and identify the potential or competitiveness of Indonesia's non-oil and gas sector in non-traditional countries. For this reason, mathematically, the RCA Index can be formulated as follows:

$$RCA = \frac{X_{ijt}/X_{jt}}{X_{iwt}/X_{wt}} \quad \text{..... (1)}$$

Description:

X_{ijt}	:	Value of of Indonesia's Non-Oil and Gas exports to non-traditional country
X_{jt}	:	Total value of exports from Indonesia to non-traditional country
X_{iwt}	:	Value of Non-Oil and Gas exports from the world to non-traditional country
X_{wt}	:	Value of the world's total exports to non-traditional country

Based on the mathematical calculation above, a country's products are said to have competitiveness in the global market when the value of the RCA index is greater than 1 (one). On the other hand, the products of an identified country do not have a comparative advantage when the value of the RCA index is less than 1 (one).

Export Product Dynamic (EPD)

This method is used to identify the competitiveness of a product whether it is in dynamic performance or not. The calculation component using the EPD method consists of a market attractiveness matrix and information about the business strength of a product in other countries. The combination of the two, both in terms of business strength and market attractiveness, produces four character positions of a product, including

https://doi.org/10.70836/jh.v9i2.58

positions that indicate that the product's performance is rising star, falling star, lost opportunity, and retreat.

Product performance in the rising star character is an ideal market position. This is because the product is identified as having a high market share in exports to the destination country. For the Lost Opportunity category, products that fall into this classification are indicated to have a dynamic decline in market share, as well as the most unwanted position. The Falling star category is also not liked, although it is still better when compared to lost opportunity. This is because the market share continues to increase, but then on the other hand it will experience a significant decrease. Meanwhile, for the classification of products that are included in the retreat character. Meanwhile, retreat is the last character found in the EPD calculation matrix and is usually undesirable, but in certain cases it can be desirable if the movement moves away from stagnant products and towards dynamic products (Oktaviani & Amaliah, 2010).

X-axis: export market share growth =

$$\frac{\sum_{t=1}^{t}\left(\frac{X_{ijt}}{W_{ijt}}\times 100\%\right)-\left(\frac{X_{ijt-1}}{W_{ijt-1}}\times 100\%\right)}{T} \ldots\ldots\ldots\ldots (2)$$

Y-axis: product market share growth =

$$\frac{\sum_{t=1}^{t}\left(\frac{X_{jt}}{W_{jt}}\times 100\%\right)-\left(\frac{X_{jt-1}}{W_{jt-1}}\times 100\%\right)}{T} \ldots\ldots\ldots\ldots (3)$$

Description:

X_{ijt}	:	The value of Indonesia's Non-Oil and Gas exports to non-traditional country
X_{jt}	:	The total value of Indonesia's exports to non-traditional country
X_{iwt}	:	The value of Non-Oil and Gas exports from the world to non-traditional country
X_{wt}	:	The Value of the world's total exports to non-traditional country
t	:	Year (2013,2020...,2021)
j	:	Countries
T	:	Many years of analysis
i	:	Commodities/Non-Oil and Gas Sectors

X-Model

X-Model is an analysis method that combines RCA and EPD analysis methods. This method is used to identify the potential development of Indonesia's export market in Non-Traditional country. In this model, the results of the analysis using the X-Model analysis method approach are divided into four market clusters consisting of market clusters consisting of market clusters that are not potential, less potential, potential and optimistic.

Tabel 1. X-Model Clustering

RCA	EPD	Market Development
RCA > 1	*Rising star*	Optimistic
	Lost opportunity	Potential
	Falling star	
	Retreat	Less Potential
RCA < 1	*Rising star*	Potential
	Lost opportunity	Less Potential
	Falling star	
	Retreat	No Potential

Source: Kemendag, (2024)

https://doi.org/10.70836/jh.v9i2.58

Stochastic Frontier Analysis with Gravity Model (SFGM)

Stochastic Frontier Analysis with Gravity Model (SFGM) is an analysis method that integrates the concepts of Stochastic Frontier Analysis (SFA) and Gravity Model to understand the relationship between a country's economic efficiency and trade interactions with other countries. Stochastic Frontier Analysis is used to measure the relative efficiency of countries in economic production, while the Gravity Model is used to evaluate the extent to which factors such as economic size and geographical distance affect trade interactions between countries. An analytical approach using SFGM is indicated to be used to gain deeper insights into how a country's economic efficiency can affect its level of global trade interaction. Factors that affect export efficiency include transportation costs, trade policies, infrastructure, political stability, and technology levels. The model predicts export flows based on the economic characteristics of the countries involved, and then compares these predictions with actual data to assess efficiency. Thus, obstacles to efficiency can be identified and analyzed, providing a basis for more effective trade policy recommendations.

Kalirajan & Singh (2008) 249 uet o 249 ced the Stochastic Frontier Analysis (SFA) model by interacting with gravitational equations aimed at explaining the variety of trading partners in trade. In this case, the trade limits estimated through this approach provide freedom in taking the optimal level of trade among the countries in the analysis. On the other hand, the Stochastic Frontier Analysis (SFA) equation in the trade gravity model (SFGM) is considered indispensable in international trade analysis because of its ability to accurately measure trade efficiency (Roperto & Edgardo, 2014). The use of the SFA model allows the analysis of factors affecting trade performance by separating the influence of inefficiency from other factors affecting trade flows between countries. Thus this situation indicates that the SFA not only considers factors such as distance, economic size, and trade barriers in the gravity model, but also identifies the level of efficiency of the country in harnessing its trade potential (Stack, 2014). Deluna and Cruz (2014).

The research on the efficiency and determinants of Indonesia's non-oil and gas exports to non-traditional markets uses variables bound by export value while the independent variables are Indonesia's Real GDP, Real GDP of trading partners, population, economic distance, real exchange rate, RCA index, area of each non-traditional country and Dummy FTA. Thus,

https://doi.org/10.70836/jh.v9i2.58

the model used to identify efficiency and the determinants of Indonesia's non-oil and gas exports to non-traditional markets in this study is as follows:

$$XNM_{Ind,j,t} = a_0 + a_1 GDP_{jt} + a_2 GDP_{it} + a_3 POP_{jt} + a_4 JEK_{ijt} + a_5 RNT_{ijt} + a_6 RCA_{ijt} + a_7 ARE_{jt} + a_8 DFTA_{ijt} + (v_{j,t} - u_{j,t}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

The predictor variable above has a different unit between one variable and another, so that it is transformed into a natural logarithm (ln). The transformation of the equation is as follows:

$$LnXNM_{Ind,j,t} = a_0 + a_1 lnGDP_{jt} + a_2 lnGDP_{it} + a_3 LnPOP_{jt} + a_4 LnJEK_{ijt} + a_5 LnRNT_{ijt} + a_6 LnRCA_{ijt} + a_7 LnARE_{jt} + a_8 DFTA_{ijt} + (v_{j,t} - u_{j,t}) \ldots (5)$$

Description:

$X_{Ind,j,t}$	:	The value of Indonesia's Non-Oil and Gas exports to each Non-Traditional country in the t year (US$)
$GDP_{j,t}$	:	Gross Indonesia Product of each Non-Traditional country in the t year (US$)
$GDP_{j,t}$	:	Gross Indonesia Product Indonesia in the t year (US$)
$POP_{,j,t}$	:	Population of each Non-Traditional country in the t year (US$)
RNT_{ijt}	:	Exchange rate in the t year (US$)
JEK_{ijt}	:	Economic Distance between Indonesia and each Non-Traditional country in year t (Km)
RCA_{ijt}	:	Indonesia's non-oil and gas commodity RCA index in each country of Non-Traditional Countries in 2020
ARE_{Jt}	:	area of each Non-Traditional trading partner country in year t (km2)
$DFTA_{ijt}$	:	A dummy is worth 1 when both countries have or are involved in the same FTA, 250uet worth 0 if both countries do not have the same FTA ties
α	:	Coefficient
$v_{(j,t)}$	:	A random disorder term whose distribution is identified with N destination $(0,\sigma_v^2)$ in the period t
$U_{(j,t)}$	:	one-sided disorder term that represents the combined effect of economic factors and other factors

Based on the description above, export efficiency is a comparison between the actual export value and its potential. Export efficiency is important in the aspect of international trade. Noviyani & Muid (2019) and Amstrong (2007) stated that if the difference between the actual and potential export value is getting smaller, then a country has carried out its trade in the most efficient way and vice versa. The export efficiency interval is at 0-1, the closer to 1, the smaller the gap between actual and potential exports or the more efficient the trade carried out by Indonesia with partner countries and vice versa.

https://doi.org/10.70836/jh.v9i2.58

RESULT AND DISCUSSION

Competitiveness and Performance of Indonesia's Non-Oil and Gas Exports in Non-Traditional Markets

In an effort to encourage an increase in Indonesia's exports, identification of power and export performance is the main thing that must be done. The importance of competitiveness analysis aims to provide an in-depth understanding of a product's competitive position in the international market and become the basis for effective policies and strategies to increase exports (Retnaningsih et al., 2024; Manalu, D.S.T., et.al, 2022).

The results of the analysis using RCA identified that the competitiveness of Indonesia's Non-Oil and Gas exports to non-traditional countries is still low or below global competitiveness. The lack of competitiveness of Indonesia's Non-Oil and Gas exports to non-traditional markets is shown by the results of the calculation of the RCA Index of less than one.

In terms of export performance, the results of the analysis using the Export Product Dynamic (EPD) approach identified that the dynamics of Indonesia's non-oil and gas export performance to non-traditional countries are in a retreat position. Retreat is a product that has poor export performance and low competitiveness. This product tends to decline both in terms of export volume and in terms of acceptance in the international market (Kim, 1982). Thus, the position of non-oil and gas export performance that retreats to Non-Traditional Markets indicates that Indonesia must strive to carry out policy strategies that can encourage increased profitability through improving product quality, innovation, product diversification and strengthening marketing strategies in these countries.

Table 2. Identification of the competitiveness of Indonesia's non-oil and gas exports to non-traditional markets

Non-Traditional Countries	RCA	EPD	X-Model
	2016-2021	2016-2021	2016-2021
Albania	0.852	*Retreat*	Market development lacks potential
Angola	0.618	*Retreat*	Market development lacks potential
Cameroon	0.928	*Retreat*	Market development lacks potential
Chile	0.645	*Retreat*	Market development lacks potential
Colombia	0.841	*Retreat*	Market development lacks potential
Congo, Rep.	0.763	*Retreat*	Market development lacks potential
Costa Rica	0.840	*Retreat*	Market development lacks potential
Dominican Republic	0.659	*Retreat*	Market development lacks potential
Ecuador	0.678	*Retreat*	Market development lacks potential
Fiji	0.577	*Retreat*	Market development lacks potential
Ghana	0.568	*Retreat*	Market development lacks potential
Guatemala	1.020	*Rising Star*	Optimistic market development
Jordan	0.827	*Lost Opportunity*	Market development lacks potential
Kenya	0.658	*Retreat*	Market development lacks potential
Lesotho	0.509	*Rising Star*	Market development lacks potential
Madagascar	0.824	*Retreat*	Market development lacks potential
Mali	0.489	*Retreat*	Market development lacks potential
Mauritania	0.587	*Rising Star*	Market development lacks potential
Mauritius	0.815	*Retreat*	Market development lacks potential
Montenegro	0.678	*Retreat*	Market development lacks potential
Morocco	0.671	*Retreat*	Market development lacks potential

https://doi.org/10.70836/jh.v9i2.58

Mozambique	0.538	*Retreat*	Market development lacks potential
Namibia	0.675	*Retreat*	Market development lacks potential
Nepal	0.985	*Rising Star*	Market development lacks potential
Nicaragua	0.684	*Retreat*	Market development lacks potential
Niger	1.010	*Retreat*	Market development lacks potential
Paraguay	0.849	*Retreat*	Market development lacks potential
Peru	1.011	*Rising Star*	Optimistic market development
Rwanda	0.971	*Retreat*	Market development lacks potential
Senegal	0.954	*Rising Star*	Market development lacks potential
Seychelles	0.832	*Retreat*	Market development lacks potential
South Africa	0.833	*Retreat*	Market development lacks potential
Sri Lanka	0.830	*Retreat*	Market development lacks potential
Tajikistan	0.157	*Lost Opportunity*	Market development lacks potential
Tanzania	0.501	*Retreat*	Market development lacks potential
Togo	0.977	*Rising Star*	Market development lacks potential
Tunisia	0.843	*Retreat*	Market development lacks potential
Uganda	0.660	*Retreat*	Market development lacks potential
Ukraine	0.677	*Retreat*	Market development lacks potential

Source: WITS and Trade map (2024), processed

Based on the description above, the results of the analysis using the X-model identified that the development position of Indonesia's non-oil and gas export market is on average in a position to develop a market with less potential. Of the 39 countries analyzed, 37 of them show that Indonesia's non-oil and gas export market development position is in a phase of less potential. However, for the Guatemala and Peru, Indonesia's non-oil and gas export position is recorded as being in an optimistic market development phase. Market development that lacks potential is a big challenge for Indonesia's exports. For this reason, one of the steps that can be taken to overcome this problem is to study more deeply the position of Indonesia's non-oil and gas export efficiency. The government also needs to increase international cooperation and expand market access through free trade agreements that can provide tariff preferences for Indonesia products.

Efficiency of Indonesia's Non-Oil and Gas Exports to Each Non-Traditional Country

The Stochastic Frontier Gravity Model (SFGM) is a model used in this study to estimate and measure export efficiency. The value of export efficiency is on a scale of 0 to 1 or 0 percent to 100 percent. If 0 means inefficiency and 1 means efficient. In this study, there was an adjustment in the number of countries analyzed from 39 countries to 28 countries. This is 252uet o the inadequate availability of data from several countries such as Cameroon, Albania, Mali, Tajikistan, Nepal, Niger, Rwanda, Uganda, Namibia and Lesotho, so that these countries are not continued for their efficiency analysis.

Table 3. Development of Efficiency of Indonesia's Non-Oil and Gas Exports to Each Non-Traditional Country in 2016 – 2021

Non-Traditional Countries	Development of Efficiency						Average
	2016	2017	2018	2019	2020	2021	
Togo	81.562	91.353	91.013	89.555	89.262	92.885	89.272
Mauritania	82.568	86.348	85.893	80.643	81.736	92.117	84.884
South Africa	85.519	83.623	79.081	73.820	75.657	83.694	80.232
Mauritius	80.382	77.561	82.898	81.559	77.967	74.717	79.181
Kenya	71.111	77.622	71.527	67.230	78.729	82.684	74.817
Tanzania	67.069	78.824	74.343	70.175	70.099	77.993	73.084
Congo, Rep.	75.717	62.597	66.801	78.810	70.732	68.709	70.561
Fiji	82.759	76.177	62.991	57.044	66.139	71.991	69.517
Jordan	69.535	70.041	66.564	62.676	61.943	86.310	69.512
Senegal	77.079	79.439	58.955	50.046	63.000	82.877	68.566
Sri Lanka	70.133	69.498	68.775	66.340	58.737	67.812	66.883
Ghana	68.396	66.388	56.224	68.198	51.508	72.898	63.935
Peru	63.523	62.124	67.216	57.443	54.454	73.479	63.040
Chile	64.648	64.503	59.905	43.314	54.424	69.114	59.318
Mozambique	56.054	44.013	62.062	76.082	32.380	72.693	57.214
Ukraine	70.609	65.839	52.158	49.096	50.695	49.476	56.312
Madagascar	60.116	69.066	59.635	48.669	36.475	57.131	55.182
Dominican R	51.036	46.358	50.175	46.854	42.998	36.857	45.713
Colombia	47.435	40.801	41.218	35.033	33.509	66.827	44.137
Ecuador	44.598	38.057	45.209	35.277	24.371	59.406	41.153

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Tunisia	32.123	40.323	38.515	31.819	30.688	54.150	37.936
Guatemala	34.454	30.124	54.424	21.338	32.261	41.402	35.667
Morocco	48.317	39.862	34.791	28.465	25.534	34.901	35.312
Seychelles	51.292	42.877	32.629	25.169	29.099	23.899	34.161
Costa Rica	68.102	28.781	46.643	22.496	9.017	16.332	31.895
Nicaragua	30.573	28.438	23.145	9.549	19.266	48.939	26.652
Paraguay	21.642	22.472	35.320	30.771	8.894	17.942	22.840
Average	60.454	57.806	57.130	51.177	48.188	60.971	55.954

Source: Stata SE 14, processed

Based on the analysis, it was found that the average value of Indonesia's export efficiency to non-traditional market areas in 2016-2021 was 55.954 percent (Table 3). This position indicates that Indonesia has still not reached its potential condition of 44,046 percent. From the perspective of each country, it was identified that the highest efficiency of Indonesia's non-oil and gas exports was in Togo with an average of 89,297 percent from 2016 to 2021. Then the second and third positions are in Mauritania and South Africa with an average efficiency of Indonesia's non-oil and gas exports of 84,884 percent and 80,232 percent during the period 2016 and 2021.

However, the results of the efficiency analysis using the Stochastic Frontier Gravity Model (SFGM) analysis method recorded that the efficiency position of Indonesia's non-oil and gas exports in 20 countries is below 70 percent, meaning that Indonesia's trade performance has not been able to be carried out efficiently with these countries. The 20 countries include Fiji, Jordan, Senegal, Sri Lanka, Ghana, Peru, Chile, Mozambique, Ukraine, Madagascar, Dominican Republic, Colombia, Ecuador, Tunisia, Guatemala, Morocco, Seychelles, Costa Rica, Nicaragua and Paraguay. Given that non-oil and gas exports are the main sectors that contribute positively to Indonesia's trade balance, the government must conduct policy mapping to encourage increased exports, quality and market diversification to non-traditional countries. This is because until now Indonesia's non-oil and gas exports are still dependent on several countries such as China, the United States, the European Union and India where these countries are traditional countries (Harahap & Widyastutik, 2020). For this reason, the next stage of this study is the identification and mapping of factors that affect Indonesia's non-oil and gas exports to non-traditional countries.

Determinants of Indonesia's Non-Oil and Gas Exports to Non-Traditional Countries

Estimation of the determinants of Indonesia's non-oil and gas exports to non-traditional countries uses the stochastic frontier gravity model method version of the technical efficiency model. Based on the results of the estimation, it was obtained that the variables of GDP of non-traditional countries, population of non-traditional countries, GDP of Indonesia, competitiveness (RCA) and area of non-traditional countries have a positive and significant effect on Indonesia's non-oil and gas exports. Meanwhile, the

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economic distance between Indonesia and non-traditional countries is estimated to have a negative and significant effect on Indonesia's non-oil and gas exports. Based on the description above, the estimation results show that Indonesia's GDP variable is a variable that has a large coefficient in influencing non-oil and gas exports to non-traditional markets. Indonesia's GDP variable coefficient of 2,157 shows that an increase in Indonesia's GDP by 1 percent will encourage an increase in Indonesia's non-oil and gas exports to non-traditional markets by 2,157 percent. The results of this estimate are in line with research conducted by Irhami (2015) and Tumwebaze Karamuriro (2015) which stated that Indonesia's GDP has a positive relationship and has a significant influence on Indonesia's exports.

Table 4. Determinants of Indonesia's Non-Oil and Gas Exports to Non-Traditional Market Countries

Variable	Coefficient	Error Standards	Probability
LOG(GDP_{jt})	0.306	0.0718	0.000**
LOG(POP_{jt})	0.339	0.0081	0,000**
LOG(GDP_{it})	2.157	0.7780	0,006**
LOG(JEK_{ijt})	-0.857	0.1169	0,000**
LOG(RNT_{ijt})	0.023	0.1811	0,211
LOG(RCA_{ijt})	1.476	0.7320	0.044**
LOG(ARE_{jt})	0.073	0.0438	0.097*
$DFTA_{ijt}$	0.025	0.0877	0.779
CONS	-22.515	9.7423	0.021**
Prob (F-statistic)			0,000
sigma-squared		0.247	0.138
gamma		0.002	0.251

Source: Stata SE 14, processed
Description: **) significant at the real level of 1 percent, *) significant at the real level of 5 percent to 10 percent

GDP and Population of Non-Traditional Countries are also estimated to have a positive and significant influence on Indonesia's non-oil and gas exports with coefficients of 0.306 and 0.339, respectively. Hotsawadi & Widyastutik (2023) Stated that the variable Approach of the GDP variable of Non-Traditional countries indicates the state of people's purchasing power in the country. Thus, an increase in GDP and Population of Non-Traditional Countries by 1 percent will encourage an increase in Indonesia's non-oil and gas exports by 0.306 percent and 0.339 percent. The results of this estimate are also in line with the results of research conducted by Kahfi (2016), Ravishankar & M. Stack, (2014) which stated that the GDP of partner countries has a significant and positive effect on export value. Then, Wardani & Mulatsih (2018) also discussed that the population of trading partner countries is significant and positively affects the value of Indonesia's exports.

The competitiveness variable (RCA) and the area of non-traditional countries also have a positive effect on Indonesia's non-oil and gas exports. This is in line with the results of research conducted by Miftah Akbar & Widyastutik, 2022) which stated that the power index (RCA) has a positive and significant effect on Indonesia's exports. Meanwhile, economic distance is predicted to have a negative and significant effect on Indonesia's non-oil and gas exports. This is also in line with the results of research

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conducted by Noviyani & Muid (2019) and Wenhui et al., (2022) which found that economic distance has a negative and significant relationship with Indonesia's exports.

CONCLUSION

Based on the description above, several things can be concluded in this study, namely (1) based on the results of competitiveness analysis (RCA) and export performance using EPD and X-Model show that the competitiveness of Indonesia's non-oil and gas exports to non-traditional countries is still low or below global competitiveness. The lack of competitiveness of Indonesia's Non-Oil and Gas exports to non-traditional markets is shown by the results of the calculation of the RCA Index of less than 1. In terms of export performance, the results of the analysis using the Export Product Dynamic (EPD) approach identified that the dynamics of Indonesia's non-oil and gas export performance to non-traditional countries are in a retreat position. This means that it has poor export performance and low competitiveness. (2) Based on the analysis carried out, the average value of Indonesia's export efficiency to non-traditional market areas in 2016-2021 was 55.954 percent. This position shows Indonesia's low ability to efficiently export non-oil and gas products to non-traditional countries. On the other hand, the results of the efficiency analysis using the Stochastic Frontier Gravity Model (SFGM) analysis method also noted that the efficiency position of Indonesia's non-oil and gas exports in 20 countries is below 70 percent, meaning that Indonesia's trade performance has not been able to be carried out efficiently with these countries. The 20 countries include Fiji, Jordan, Senegal, Sri Lanka, Ghana, Peru, Chile, Mozambique, Ukraine, Madagascar, Dominican Republic, Colombia, Ecuador, Tunisia, Guatemala, Morocco, Seychelles, Costa Rica, Nicaragua, and Paraguay. (3) Based on the results of the estimation, it was obtained that the variables of GDP of non-traditional countries, population of non-traditional countries, GDP of Indonesia, competitiveness (RCA) and area of non-traditional countries have a positive and significant effect on Indonesia's non-oil and gas exports. Meanwhile, the economic distance between Indonesia and non-traditional countries is estimated to have a negative and significant effect on Indonesia's non-oil and gas exports.

POLICY RECOMMENDATIONS

Based on the results of the research, a number of policies are needed that are expected to be the first step in improving the performance of Indonesia's non-oil and gas

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exports to non-traditional countries. The government needs to increase the competitiveness of export products through the development of high-value-added products, production efficiency, and quality improvement in accordance with international standards. Fiscal incentives and technological research support should be given to export-oriented industries. Export product diversification strategies also need to focus on potential commodities with high demand in countries such as Fiji, Senegal, and Peru, as well as superior products such as processed foods, textiles, and electronics. For this reason, the government must improve logistics efficiency by strengthening transportation infrastructure, reducing shipping costs, and improving trade connectivity to minimize the negative impact of the economic distance between Indonesia and destination countries.

Strengthening bilateral and multilateral cooperation is a priority, through negotiations on the elimination of tariffs and non-tariff barriers with non-traditional countries such as Tunisia, Colombia, and Mozambique. In addition, marketing strategies through active participation in international trade exhibitions and trade missions need to be improved to introduce Indonesian products and must also be supported by increasing the capacity of human resources through technical training related to export management, market research, and product quality standards must be implemented so that exporters are more competitive.

REFERENCES

Alim, G. I. (2019). Analisis Penerapan Gravity Model dan Dampak Kebijakan Domestic Market Obligation (DMO) terhadap Perdagangan Internasional LNG Indonesia. *Jurnal Ilmiah Mahasiswa FEB*, *7*(2), 1–14.

Amstrong, S. (2007). Crawford School of Economics and Government Measuring Trade and Trade Potential : a Survey. *Asian Economic Papers*, *368*. https://crawford.anu.edu.au/pdf/pep/apep-368.pdf

Fitriani, E. (2019). Analisis Pengaruh Perdagangan Internasional Terhadap Pertumbuhan Ekonomi Indonesia. *JURISMA : Jurnal Riset Bisnis & Manajemen*, *9*(1), 17–26. https://doi.org/10.34010/jurisma.v9i1.1414

Hadiyanto, Y. R. (2015). *Pengaruh Diversifikasi Ekspor Terhadap Pertumbuhan NILAI TAMBAH PER TENAGa kerja Sektor Manufaktur Berbasis Agro dan The effect of Export Diversification on the Value Added Growth Per Labor of Agro and Non-agro*

https://doi.org/10.70836/jh.v9i2.58

Based Manufacturing Sector PENDAHULUAN Perek. 179–200.

Harahap, H., & Widyastutik. (2020). Diversifikasi Ekspor Non Migas Indonesia Ke Pasar Non Tradisional. *Buletin Ilmiah Litbang Perdagangan*, *14*(2), 215–238. https://doi.org/10.30908/bilp.v14i2.442

Head, K., & Mayer, T. (2004). The Empirics of Agglomeration and Trade To cite this version: The Empirics of Agglomeration and Trade. In *Handbook of Regional and Urban Economics* (Vol. 4). https://hal-sciencespo.archives-ouvertes.fr/hal-01027789

Hotsawadi, & Widyastutik. (2023). Menavigasi Daya Saing dan Determinan Ekspor Unggulan Indonesia di Kawasan Carribean Community (Caricom). *Buletin Ilmiah Litbang Perdagangan*, *17*(2), 203–224. https://doi.org/10.55981/bilp.2023.224

Ingot, S. R., & Ulfa, N. (2023). Potensi Peningkatan Perdagangan Melalui Kerja Sama Asean-Bangladesh Preferential Trade Agreement (Pta). *Trade Policy Journal*, *September*, 35–52. https://jurnal.kemendag.go.id/TPJ/article/view/872%0Ahttps://jurnal.kemendag.go.id/TPJ/article/download/872/408

Irhami, M. (2015). Stochastic Gravity Model and Trade Efficiency for Indonesia. *Economics and Finance in Indonesia*, *55*(2), 177. https://doi.org/10.7454/efi.v55i2.115

Kahfi, A. S. (2016). Determinants of Indonesia'S Exports of Manufactured Products: a Panel Data Analysis. *Buletin Ilmiah Litbang Perdagangan*, *10*(2), 187–202. https://doi.org/10.30908/bilp.v10i2.54

Kalirajan, K., & Singh, K. (2008). A comparative analysis of China's and India's recent export performances. *Asian Economic Papers*, *7*(1), 1–28. https://doi.org/10.1162/asep.2008.7.1.1

Kemendag. (2024). *Rencana Strategi 2020-2024*. http://bppp.kemendag.go.id/.

Kim, K. H. (1982). Juche in international trade. In *Mathematical Social Sciences* (Vol. 3, Issue 2). https://doi.org/10.1016/0165-4896(82)90051-8

Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2018). International Economics, Theory and Policy, Global Edition by Paul R. Krugman, Maurice Obstfeld, Marc J. Melitz, (z-lib.org). In *Pearson Education : Harlow., 2018* (Vol. 11, Issue International Economics).

Manalu, D.S.T., Harianto., Suharno.,

https://doi.org/10.70836/jh.v9i2.58

Hartoyo, S. (2022). Analisis Daya Saing Serta Faktor-Faktor yang Memengaruhi Pangsa Pasar Negara Eksportir Utama Kopi di Negara Importir Utama Kopi. *Buletin Ilmiah Litbang Perdagangan*, *16*(1), 1–24. https://jurnal.kemendag.go.id/bilp/article/view/445

Miftah Akbar, F., & Widyastutik. (2022). Analysis of Competitiveness, Dynamics, and Determinants of Main Commodity Export Demand from Indonesia to United Kingdom. *Jurnal Ekonomi Dan Kebijakan Pembangunan*, *11*(2), 108–131. https://doi.org/10.29244/jekp.11.2.2022.108-131

Noviyani, E., & Muid, D. (2019). Pengaruh Return on Assets, Leverage, Ukuran Perusahaan, Intensitas Aset Tetap, dan Kepemilikan Institusional terhadap Penghindaran Pajak. *Diponegoro Journal of Accounting*, *8*(3), 1–11.

Oktaviani, R., & Amaliah, S. (2010). Dampak Free Trade Arrangements (Fta) Terhadap Ekonomi Makro, Sektoral, Regional, Dan Distribusi Pendapatan Di Indonesia (the Impact of Free Trade Agreement (Fta) on Indonesian Macro Economic, Sectoral, and Income Distribution). *Jurnal Ilmu Pertanian Indonesia*, *15*(3), 192–204.

Oktaviani, R., & Drynan, R. G. (2000). The Impact of Apec Trade Liberalisation on the Indonesian Economy and Agricultural Sector. *The Thrid Annual Conference on Global Economic Analysis. Nuni 28 - 30 2000. Melbourne, Australia*, 1–20.

Oktaviani, R., & Novianti, T. (2014). *Teori Perdagangan Internasional Dan Aplikasinya Di Indonesia.* IPB Press.

Ravishankar, G., & M. Stack, M. (2014). The Gravity Model and Trade Efficiency: A Stochastic Frontier Analysis of Eastern European Countries' Potential Trade. *The World Economy*, *37*(5), 690–704. https://doi.org/https://doi.org/10.1111/twec.12144

Retnaningsih, Y., Indah, P. N., & Laily, D. W. (2024). *Mimbar Agribisnis : Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis Analisis Tingkat Daya Saing Cengkeh Indonesia terhadap Negara Pesaing : Tanzania dan Madagaskar Analysis of the Level of Competitiveness of Indonesian Cloves Against Competing Co*. *10*, 2906–2912.

Roperto, J. D., & Edgardo, C. (2014). Philippine Export Efficiency and Potential: An Application of Stochastic Frontier Gravity Model. *World Journal of Economic and Finance*, *1*(2), 006–015.

https://doi.org/10.70836/jh.v9i2.58

Sabaruddin, S. S. (2017). Strengthening Indonesia's Economic Diplomacy Designs Clustering of Indonesia's Export Market Destinations: Traditional Markets vs. Non-Traditional Markets. *Jurnal Ilmiah Hubungan Internasional*, *12*(2), 205–221.

Tumwebaze Karamuriro, H. (2015). Determinants of Uganda's Export Performance: A Gravity Model Analysis. *International Journal of Business and Economics Research*, *4*(2), 45. https://doi.org/10.11648/j.ijber.20150402.14

Wardani, M. A., & Mulatsih, S. (2018). Analisis Daya Saing Dan Faktor-Faktor Yang Memengaruhi Ekspor Ban Indonesia Ke Kawasan Amerika Latin. *Jurnal Ekonomi Dan Kebijakan Pembangunan*, *6*(1), 81–100. https://doi.org/10.29244/jekp.6.1.81-100

Wenhui, J. I., Zhang, H., & Lin, Y. (2022). Trade Sustainability and Efficiency under the Belt and Road Initiative: A Stochastic Frontier Analysis of China's Trade Potential at Industry Level. *Emerging Markets Finance and Trade*, *58*(6), 1740–1752. https://doi.org/https://doi.org/10.1080/1540496X.2021.1925246