

## Analysis of the Determinants of the Competitiveness of Indonesian Knitted Women's Clothing Exports (HS 6104) to the United States for the Period 1994-2024

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**Abstract:** *The rapid development of e-commerce in Indonesia has changed consumer purchasing behavior, particularly in the use of online information and promotional incentives when making purchasing decisions. This study aims to examine the effect of online customer ratings, online customer reviews, and free shipping vouchers on purchase decisions among students of Pasir Pengaraian University using the Shopee application. This study employed a quantitative approach using a survey method. The sample consisted of 100 students selected through purposive sampling based on predetermined criteria. Data were collected through questionnaires and analyzed using multiple linear regression, t-tests, F-tests, and the coefficient of determination, preceded by classical assumption tests. The results show that online customer ratings do not have a significant effect on purchase decisions, while online customer reviews and free shipping vouchers have positive and significant effects. Simultaneously, online customer ratings, online customer reviews, and free shipping vouchers have a significant effect on purchase decisions. The coefficient of determination indicates that the three variables explain 67.4% of the variation in purchase decisions, while the remaining 32.6% is explained by other factors outside the research model. These findings indicate that students tend to rely more on detailed information from other consumers and the economic benefits of free shipping promotions than on product ratings alone. From an Islamic economic perspective, the findings emphasize the importance of truthful reviews, transparency in promotional offers, fairness, and responsible marketing practices in digital transactions.*

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### Introduction



International trade is a crucial mechanism for expanding markets, increasing production activity, and strengthening economic integration between countries. For developing countries, exports serve not only as a source of foreign exchange but also as a means to increase production scale and expand involvement in global trade networks. Export performance cannot be assessed solely on the basis of growth in trade value or volume, as increased exports do not necessarily reflect a country's strengthening position relative to its competitors. Export competitiveness is an important indicator of a country's ability to maintain the relative position of its products in the international market, particularly when changes in demand, trade policies, relative prices, and the economic conditions of destination countries continue to influence the structure of trade (Krugman, P.R., Obstfeld, M., & Melitz, 2022); (Ruzekova et al., 2020) placing export performance as one approach to measuring competitiveness because changes in export performance can reflect changes in a country's competitive position in international trade.

The manufacturing industry holds a strategic position in international trade due to its links to value-added creation, productivity, employment, and economic structural diversification. Manufacturing development is also a crucial part of the economic transformation process, enabling developing countries to increase production capacity and expand their involvement in trade in value-added goods. Wan et al., (2022) An analysis of 130 developing countries from 1996 to 2019 shows that manufacturing sector development has a positive relationship with economic growth. Manufacturing's role in trade is determined not only by its ability to increase exports but also by the industry's ability to maintain productivity and competitiveness amidst changes in the global trade structure.

The textile and apparel industry is a manufacturing subsector facing intense international competition. The industry's relatively labor-intensive nature, the large number of supplier countries, and rapidly changing consumer preferences mean that product competitiveness is determined not only by price, but also by quality, production flexibility, timely delivery, and the ability to meet market standards. Changes in the structure of the global value chain have also increased demands on suppliers to upgrade, moving beyond serving as a production base with low added value. Choksy et al., (2022). shows that supplier resilience in the global apparel value chain is related to the ability to adapt and upgrade when facing disruptions in demand and the supply chain. Warasthe et al. (2022) also shows that economic, environmental and social aspects are increasingly integrated in the management of the textile and apparel supply chain.

The textile and textile products (TPT) industry plays a strategic role in the Indonesian economy, contributing to exports and providing significant employment. The Ministry of Industry noted that the Indonesian TPT industry contributed approximately US\$5.76 billion to exports in 2024 and employed up to 3.87 million workers. This substantial contribution demonstrates that TPT export performance is not only related to foreign exchange earnings but also to the sustainability of manufacturing activities and domestic employment. This position becomes increasingly important as the Indonesian TPT industry faces competitive pressures from other exporting countries with relatively strong production capacity, production costs, and market access. This situation places the ability to maintain export competitiveness as a crucial aspect in maintaining the sustainability of the Indonesian TPT industry.

The United States market holds a strategic position in the apparel trade as it is the largest single importer of apparel among countries in the world. The value of US apparel imports reached US\$79.3 billion in 2023, with the majority of supply coming from Asian countries. Indonesia was among the ten largest apparel suppliers to the United States that year, along with Bangladesh, Cambodia, India, and Pakistan. At the same time, the US supplier structure showed significant competitive changes during 2013–2023, marked by a decline in China's share and an increase in the share of several other Asian suppliers, including Vietnam and Bangladesh. This structure indicates that the strong demand from the United States creates significant market opportunities and intensifies competition for apparel exporting countries, including Indonesia (USITC, 2024).

Knitted women's clothing with the HS code 6104 plays a crucial role in Indonesian exports to the United States. ITC Trade Map data analyzed in the study shows that in 2024, the United States absorbed approximately 61.4 percent of Indonesia's HS 6104 exports, significantly higher than Japan's 5.6 percent and South Korea's 5.1 percent. Indonesia's HS 6104 exports to the United States reached US\$543,511 million out of Indonesia's total HS 6104 exports to the world of US\$806,488 million. On

the demand side, the value of global HS 6104 imports from the United States reached US\$5.574 billion in the same year. The large proportion of Indonesian exports directed to the United States market demonstrates the high dependence of HS 6104 commodities on that market, so changes in the United States' economic and trade conditions have significant implications for Indonesia's export performance.

Indonesia's high dependence on the United States market has not fully reflected its position as a major supplier. In 2024, Indonesia's share of US HS 6104 imports was only around 8.52 percent, while Vietnam controlled around 30.08 percent and China 21.38 percent. This difference indicates that Indonesia's high dependence on the United States market does not equate to its dominance in that market. Indonesia still faces strong competition from countries with larger production capacities and trade networks. This is important because changes in relative competitiveness can occur even if Indonesia's export value continues to increase. Therefore, export performance evaluations need to consider Indonesia's relative position in the trade structure of destination markets.

The use of HS 6104 as the research object is necessary to capture trade characteristics at a more specific product level. The HS 61 group encompasses a wide range of knitwear with different product characteristics and demand structures, so analysis at the aggregate level can potentially obscure variations in competitiveness between products. Using trade data with a higher level of disaggregation allows for more precise identification of patterns of specialization and competition between products.(Fontagné et al., 2006)HS 6104 also makes a relatively large contribution to Indonesian knitwear exports to the United States. In 2024, this commodity contributed approximately 28.04 percent of Indonesia's total HS 61 exports to the United States, higher than HS 6106's 11.10 percent, HS 6103's 9.97 percent, and HS 6109's 9.88 percent.

The development of Indonesia's HS 6104 exports shows that export increases do not always go hand in hand with strengthening positions relative to competing countries. During 2003–2024, the value of Indonesia's HS 6104 exports to the United States increased, but the growth was relatively slower than that of China, Vietnam, and Bangladesh. Indonesia's export index, using 2003 as the base year, reached 1,238.19 in 2021 before declining to 1,010.91 in 2024, while China's reached 5,849.64 in 2024. These changes occurred in an increasingly competitive trade environment following the end of the textile quota system through the Agreement on Textiles and Clothing in 2005, which increased competitive pressures among supplier countries. These dynamics indicate that increased demand from the United States market did not automatically result in an improvement in Indonesia's relative position in the knitted women's apparel trade.

Indonesia's comparative advantage in HS 6104 remains evident throughout the study period, but the level of this advantage changes over time. The calculation of Revealed Comparative Advantage (RCA) shows that Indonesia's RCA value is above one during the period 1994–2024, while the Revealed Symmetric Comparative Advantage (RSCA) value remains positive. This condition indicates that Indonesia has a revealed comparative advantage in HS 6104 trade in the United States market, but fluctuations in the index value indicate that this position is not completely stable. RSCA is used because the transformation produces a measure of comparative advantage that is more symmetric to the neutral value than RCA, making it more suitable for statistical and econometric analysis (Balassa 1965;Laursen, 1998). The changes in competitiveness raise questions regarding economic factors and policies that can explain the variations in Indonesia's position, especially the economic conditions of the United States market represented by GDP per capita, the Real Exchange Rate as an indicator of relative prices, United States import tariffs as an instrument of trade policy, and the value of United States HS 6104 imports from the world as a proxy for market demand. This study aims to analyze the level of competitiveness and determinants of the competitiveness of Indonesian knitted women's clothing (HS 6104) exports to the United States during the period 1994–2024.

## Literature review

International trade describes the exchange of goods and services between countries that arises because of differences in resources, technology, productivity, relative prices, and consumer preferences. Through specialization and exchange, trade allows countries to expand their markets for domestic products while simultaneously acquiring goods that cannot be produced efficiently domestically. (Krugman, P.R., Obstfeld, M., & Melitz, 2022;Feenstra, RC, & Taylor, 2021). The development of

modern trade theory expands this explanation through economies of scale, product differentiation, and imperfect competition, so that trade is not solely determined by differences in production factors between countries. (Feenstra, R.C., & Taylor, 2021) This perspective is relevant to the women's knitwear trade because HS 6104 products have differentiating characteristics through design, material quality, branding, and the ability to meet consumer preferences. A country's position in the apparel trade is also influenced by the industry's ability to integrate production processes and respond to market needs, not just by low production costs (World Bank 2020; Jensen & Whitfield, 2022).

The theory of comparative advantage explains that the benefits of trade arise when a country specializes in products that have a relatively lower opportunity cost than other countries. (Krugman, P.R., Obstfeld, M., & Melitz, 2022). The Ricardian perspective links these advantages to differences in productivity, while the Heckscher-Ohlin model emphasizes differences in the abundance of factors of production as the basis for trade specialization. (Feenstra, R.C., & Taylor, 2021). The textile and apparel industry theoretically offers comparative advantage opportunities for countries with relatively abundant labor, but this advantage is not permanent. Changes in technology, labor quality, access to raw materials, production efficiency, and position in the global value chain can alter a country's competitiveness over time (World Bank 2020 ; Jensen & Whitfield, 2022). Such differences may also appear at a more detailed product level; Hasan et al., (2024). shows that the comparative advantage of the apparel industry can differ across product categories, so analysis at the HS 6104 level is necessary to avoid overly aggregate conclusions.

The concept of export competitiveness is used to assess a country's ability to maintain its product's relative position in the international market compared to competing countries. Competitiveness is reflected not only in the value of exports but also in the ability to maintain market share through productivity, efficiency, quality, innovation, and demand conditions and industrial structure. (Gujarati & Porter, 2009; Vollrath, 1991) In the context of the United States apparel trade, supplier competitiveness is influenced by production costs, productivity, access to inputs, industrial integration, and the ability to meet buyer needs. Indonesia itself has an advantage in producing relatively high-value apparel despite facing a higher cost structure than some other suppliers (USITC, 2024). Trade-based competitiveness can be measured through Revealed Comparative Advantage (RCA), which identifies comparative advantages based on a country's actual export structure (Balassa 1965; Vollrath, 1991).

The limitations of the asymmetric nature of RCA then encourage the use of Revealed Symmetric Comparative Advantage (RSCA), which transforms RCA into the range of -1 to +1 so that it is more suitable for comparison and econometric analysis. (Laursen, 1998).

Export competitiveness can be determined by the economic conditions of the destination country, relative prices, trade policies, and market demand developments. The United States' GDP per capita is used to represent economic capacity and market purchasing power, as increased income can expand the public's ability to consume imported goods. (Feenstra, R.C., & Taylor, 2021). Within the framework of trade gravity, the economic size of partner countries is one of the factors related to the intensity of bilateral trade. (Yotov et al., 2016). Real Exchange Rate (RER) represents the relative price between countries after taking into account the price level and is therefore related to the price competitiveness of export products. (Chinn, 2006). RER depreciation in the definition of rupiah per US dollar can theoretically increase the price competitiveness of Indonesian products, although the impact depends on the elasticity of demand and the structure of industrial inputs. (Gujarati & Porter, 2009). Import tariffs are trade barriers that increase the price of imported products in the destination market, thus potentially reducing demand and the competitiveness of exporters. (Krugman, P.R., Obstfeld, M., & Melitz, 2022).

Market demand is also a crucial determinant, as growth in destination markets creates export opportunities that are not always equally exploited by all supplier countries. In international trade, the value of a country's imports of a product can be used to represent the extent of market demand for that product. (Krugman, P.R., Obstfeld, M., & Melitz, 2022). Fagerberg et al., (2007) shows that the development of market demand is related to changes in export market share, while Athukorala & Yamashita, (2006) shows that increasing imports from destination countries can expand trade opportunities for Asian countries. Tandra et al. (2022) also found that increased market demand can be



associated with increased RSCA if the exporting country is able to capture the growth in demand. This relationship is not automatic, as increased US imports can be absorbed more by competing countries. Therefore, the value of global US HS 6104 imports is used as a proxy for market demand, but its impact on Indonesia's RSCA theoretically depends on Indonesia's ability to maintain or improve its position relative to other suppliers.

The characteristics of HS 6104 reinforce the relevance of using a competitiveness approach at the product level. HS 6104 covers women's and girls' apparel made by knitting or crocheting, including suits, dresses, skirts, trousers, blazers, and similar garments. These products are fashion-sensitive, so their competitiveness is determined not only by price, but also by design, material quality, finishing, sizing accuracy, production flexibility, and speed of order fulfillment. Changing consumer and supply chain demands also make sustainability aspects increasingly relevant in the apparel industry (Sarasi et al., 2023.; Warasthe et al. 2022).

This situation explains why changes in exchange rates or tariffs cannot be separated from the industry's ability to maintain its relative position. Indonesia's competition with China, Vietnam, Bangladesh, and other supplier countries also demonstrates that changes in US demand must be analyzed within the framework of international competition, not solely through changes in the value of Indonesian exports. The USITC (2024) findings regarding differences in the competitive structure of apparel suppliers to the United States reinforce the importance of simultaneously examining cost, industrial integration, quality, and order fulfillment factors.

Previous research shows that economic and trade factors have different influences on export competitiveness between products and destination countries. Exports et al., (2023) found that GDP per capita and exchange rates were related to the competitiveness of Indonesian exports to the United States, while Irvansyah et al. (2020) shows that GDP per capita, exchange rate, prices, and tariffs play a role in explaining Indonesia's textile and clothing exports. Saputra & Budiningsih, (2025) also found a relationship between GDP per capita and the real exchange rate on Indonesian textile exports. Chen et al., (2023). shows that GDP, exchange rate, and trade openness are important factors in textile trade of producing countries, while Hasan et al., (2024). shows that the level of comparative advantage of apparel can differ at a more detailed product level.

The differences in the characteristics of the research results indicate that the relationship between economic conditions, trade policies, market demand, and competitiveness is not always uniform. Some studies also still use RCA or analyze the textile and clothing industry in aggregate, while studies that specifically use RSCA to analyze the determinants of the competitiveness of Indonesian HS 6104 knitted women's clothing in the United States market are still limited. This study fills this gap by analyzing the influence of US GDP per capita, the real exchange rate, US import tariffs, and the value of US HS 6104 imports from the world on Indonesia's RSCA during the period 1994–2024.

## Method

This study uses a quantitative approach with a time series regression method. Time series data is used because the study focuses on changes in the competitiveness of Indonesian knitted women's clothing exports to one destination country over a certain period, so it can capture the dynamics of the relationship between variables over time. The research object includes Indonesian knitted women's clothing exports with HS code 6104 to the United States during the period 1994–2024. The dependent variable in this study is export competitiveness measured using Revealed Symmetric Comparative Advantage (RSCA), which is a transformation of Revealed Comparative Advantage (RCA). RCA is used to identify comparative advantages based on the actual trade structure, while RSCA is used as a measure of competitiveness in econometric models because it has more symmetrical distribution characteristics (Balassa 1965; Vollrath, 1991; Laursen, 1998).

The data used are annual secondary data for the period 1994–2024 with a total of 31 observations. The trade data used include the value of Indonesian HS 6104 knitted women's clothing exports to the United States, total Indonesian exports to the United States, the value of world HS 6104 exports to the United States, total world exports to the United States, and the value of United States HS 6104 imports from the world. The data were obtained from the United Nations Commodity Trade Statistics Database (UN Comtrade) and used to calculate RCA and RSCA and form market demand

variables. The independent variables consist of United States GDP per capita, Real Exchange Rate (RER), United States import tariffs for HS 6104, and the value of United States imports for HS 6104 from the world as a proxy for market demand. United States GDP per capita data and the data used to calculate RER were obtained from the World Bank, while import tariff data were obtained from the World Integrated Trade Solution (WITS). Several variables were transformed into natural logarithms, namely US GDP per capita, RER, and the value of US imports HS 6104, while the tariff variable was used in its original form. The selection of these variables was based on previous research that showed the relevance of the economic conditions of the destination country, exchange rates, tariffs, and market demand in explaining export performance and competitiveness (Irvansyah et al. 2020;Exports et al., 2023;Tandra et al. 2022)

The research model used is as follows:  $RSCA_t = \beta_0 + \beta_1 \ln GDPPCUS_t + \beta_2 \ln RER_t + \beta_3 \text{TARIFF}_t + \beta_4 \ln \text{IMPUS6204}_t + \varepsilon_t$ .

The index indicates the year of observation, while is the competitiveness index of Indonesian HS 6104 knitted women's clothing exports in the United States. is the GDP per capita of the United States, is the Real Exchange Rate of Indonesia against the United States, is the United States import tariff for HS 6104 commodities, and is the value of United States imports for HS 6104 commodities from the world as a proxy for market demand is a constant, is the coefficient of the estimated parameter, and is the error term. The research model is adapted fromExports et al., (2023) Irvansyah et al. (2020)AndTandra et al. (2022)with adjustments for commodities, destination countries, observation periods, and data availability. The use of OLS in export competitiveness research is also used byExports et al., (2023), while economic variables such as GDP per capita, exchange rates, and tariffs are used in the research.Irvansyah et al. (2020)

Model estimation was performed using Ordinary Least Squares (OLS) with Stata 17 software. Model feasibility testing was performed through a multicollinearity test using the Variance Inflation Factor (VIF), a heteroscedasticity test using White's Test, an autocorrelation test, and a normality test to ensure the residual characteristics meet the conditions required in interpreting the estimation results. Hypothesis testing was performed through a partial test (t-test) to determine the effect of each independent variable on RSCA, a simultaneous test (F-test) to determine the effect of independent variables together, and a coefficient of determination ( $\alpha$ ) to measure the model's ability to explain variations in the competitiveness of Indonesian knitted women's clothing exports in the United States market. The use of these diagnostic tests is necessary because the research data is in the form of a time series, so the validity of OLS inference is not only determined by the significance of the coefficients, but also by the residual characteristics and the relationships between variables in the model.(Gujarati & Porter, 2009).

**Table 1 Operationalization of Variables**

| Variables                                              | Notation | Operational Definition                                                                                       | Source                                 | Unit                |
|--------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------|
| <i>Revealed Symmetric Comparative Advantage (RSCA)</i> | RSCA     | HS 6104 Indonesia's export competitiveness index to the United States is a transformation of the RSCA value. | UN Comtrade                            | Index               |
| United States GDP per capita                           | GDPPCUS  | The average value of income or economic output generated per resident of the United States.                  | World Bank                             | Current USD/Capital |
| <i>Bilateral Real Exchange Rate</i>                    | RER      | Indonesia's bilateral real exchange rate against the United States.                                          | World Bank                             | Index               |
| United States HS 6104 Import Tariff                    | TARIFF   | Import tariffs imposed by the United States on HS 6104 commodities.                                          | World Integrated Trade Solution (WITS) | Decimal             |

|                                                                                        |           |                                                       |            |     |
|----------------------------------------------------------------------------------------|-----------|-------------------------------------------------------|------------|-----|
| Import Value of Knitted Women's Clothing (HS 6104) of the United States from the world | IMPUS6104 | United States import request for HS 6104 commodities. | World Bank | USD |
|----------------------------------------------------------------------------------------|-----------|-------------------------------------------------------|------------|-----|

## Results and Discussion

### Descriptive Statistics

Descriptive statistics are used to describe the initial characteristics of the research variables. The data used include 31 annual observations during the period 1994–2024. The research variables consist of Revealed Symmetric Comparative Advantage (RSCA) as an indicator of the competitiveness of Indonesian knitted women's clothing (HS 6104) exports in the United States market, as well as United States GDP per capita (lnGDPPCUS), Real Exchange Rate (lnRER), United States import tariffs for HS 6104 commodities (TARIFF), and the value of United States imports of HS 6104 commodities from the world (lnIMPUS6104) as independent variables. The results of descriptive statistics show variations in each variable during the research period, especially in RSCA and the value of United States HS 6104 imports which reflect changes in competitiveness and market demand dynamics during the observation period.

**Table 2. Descriptive Statistics**

| VARIABEL         | OBS | MEAN      | STD. DEVIASI | MIN       | MAX       |
|------------------|-----|-----------|--------------|-----------|-----------|
| <b>RSCA</b>      | 31  | 0.7187347 | 0.1965363    | 0.1666584 | 0.8989477 |
| <b>GDPPCUS</b>   | 31  | 10.77306  | 0.3067901    | 10.229    | 11.34491  |
| <b>RER</b>       | 31  | 9.328414  | 0.2157735    | 8.993237  | 9.963887  |
| <b>TARIFF</b>    | 31  | 0.130571  | 0.008613     | 0.1198    | 0.1518    |
| <b>IMPUS6104</b> | 31  | 21.91691  | 0.600949     | 20.97815  | 22.73674  |

### 4.2 Revealed Com (RSCA) Test

### Advantage

Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) analyses were conducted to identify comparative advantages and measure the competitiveness of Indonesian knitted women's clothing (HS 6104) exports in the United States market during the period 1994–2024. The calculation results show that the RCA value is always above one, while the RSCA value is always positive with a range of 0.17–0.90. This condition indicates that Indonesia consistently has a comparative advantage and competitiveness in HS 6104 commodities in the United States market, although the level of competitiveness fluctuates throughout the study period. Thus, Indonesia's HS 6104 commodity has a relatively strong competitive position in the United States market and the RSCA value is then used as a dependent variable in the OLS regression model to analyze the factors that influence changes in competitiveness.

**Table 3. Test Results Revealed Comparative Advantage(RCA) & Revealed Symmetric Comparative Advantage(RSCA)**

| TAHUN | RCA INDONESIA | RSCA INDONESIA |
|-------|---------------|----------------|
| 1994  | 2,53          | 0,43           |
| 1995  | 2,07          | 0,35           |
| 1996  | 2,39          | 0,41           |
| 1997  | 2,06          | 0,35           |
| 1998  | 1,40          | 0,16           |
| 1999  | 2,64          | 0,45           |
| 2000  | 4,95          | 0,67           |
| 2001  | 4,35          | 0,63           |
| 2002  | 3,97          | 0,60           |
| 2003  | 4,61          | 0,64           |
| 2004  | 5,84          | 0,71           |
| 2005  | 8,43          | 0,79           |
| 2006  | 9,50          | 0,81           |
| 2007  | 8,10          | 0,78           |
| 2008  | 11,07         | 0,84           |
| 2009  | 11,25         | 0,84           |
| 2010  | 10,17         | 0,83           |
| 2011  | 11,34         | 0,84           |
| 2012  | 12,38         | 0,86           |
| 2013  | 11,02         | 0,84           |
| 2014  | 10,08         | 0,82           |
| 2015  | 8,76          | 0,80           |
| 2016  | 8,86          | 0,80           |
| 2017  | 10,75         | 0,84           |
| 2018  | 13,29         | 0,87           |
| 2019  | 14,33         | 0,88           |
| 2020  | 12,35         | 0,86           |
| 2021  | 11,26         | 0,85           |
| 2022  | 10,19         | 0,83           |
| 2023  | 16,62         | 0,89           |
| 2024  | 12,71         | 0,85           |

### Multicollinearity Test

Multicollinearity test was conducted to determine whether there is a strong linear relationship between independent variables in the regression model. The test was conducted using the Variance Inflation Factor (VIF), with the criterion that the model is declared free from multicollinearity symptoms if the VIF value <10. Based on the test results, all independent variables have VIF values below 10, with the highest value in the variable lnIMPUS6104 of 9.96, followed by lnGDPPCUS of 8.93, TARIFF of



2.54, and lnRER of 1.56. The Mean VIF value of 5.75 is also still below the critical limit. Thus, the research model does not show serious symptoms of multicollinearity and all independent variables can be retained in the regression model for further analysis.

**Table 4. Multicollinearity Test Results**

| VARIABEL        | VIF         | 1/VIF    |
|-----------------|-------------|----------|
| lnGDPPCUS       | 8.93        | 0.111948 |
| lnRER           | 1.56        | 0.640278 |
| TARIFF          | 2.54        | 0.393188 |
| lnIMPUS6104     | 9.96        | 0.100417 |
| <b>Mean VIF</b> | <b>5.75</b> | -        |

### Robust Heteroscedasticity Test

The heteroscedasticity test was conducted using White's Test with the basis of decision making that the Prob value  $> \chi^2 > 0.05$  indicates the absence of heteroscedasticity, while the Prob value  $> \chi^2 < 0.05$  indicates the presence of heteroscedasticity. Based on the test results, the Prob value  $> \chi^2$  of 0.0132 was obtained, which is smaller than 0.05, so  $H_0$  was rejected and the regression model was declared to have symptoms of heteroscedasticity. This condition indicates that the variance of the error term is not constant between observations. This problem was handled by using heteroscedasticity-robust standard errors in OLS estimation, which does not change the value of the regression coefficient but adjusts the standard error so that the t, F, and significance levels tests become more reliable. Thus, the results of OLS estimation with robust standard errors were used in the regression analysis of this study.

**Table 5. Heteroscedasticity Test Results**

| VARIABEL | Chi <sup>2</sup> | Prob > Chi <sup>2</sup> |
|----------|------------------|-------------------------|
| Nilai    | 28.26            | 0.0132                  |

**Table 6. Robust Heteroscedasticity Test Results**

| Variabel           | Koefisien | Prob.           |
|--------------------|-----------|-----------------|
| <b>lnGDPPCUS</b>   | 0.42425   | 0.001 ***       |
| <b>lnRER</b>       | -0.33487  | <u>0.014</u> ** |
| <b>TARIFF</b>      | -12.77927 | 0.000 ***       |
| <b>lnIMPUS6104</b> | -0.07650  | 0.252           |
| <b>Constanta</b>   | 2.61731   | 0.156           |

### Autocorrelation Test

The autocorrelation test was conducted using the Breusch–Godfrey Lagrange Multiplier (LM) Test with the basis of decision making that the Prob value  $> \chi^2 > 0.05$  indicates the absence of autocorrelation, while the Prob value  $> \chi^2 < 0.05$  indicates the presence of autocorrelation. Based on the test results, the Prob value  $> \chi^2$  of 0.2018 was obtained, which is greater than 0.05, so  $H_0$  was accepted and the regression model was declared not to experience autocorrelation. This condition indicates that there is no serial correlation between residuals in the observation period. Thus, the model does not show symptoms of autocorrelation and can be used for further regression analysis.

**Table 7. Autocorrelation Test Results**

| Lags (p) | Chi <sup>2</sup> | df | Prob > Chi <sup>2</sup> |
|----------|------------------|----|-------------------------|
| Value    | 1.629            | 1  | 0.2018                  |

### Normality Test

The normality test was conducted using the Shapiro–Wilk Test with the basis of decision making that the value of  $\text{Prob} > z > 0.05$  indicates a normally distributed residual, while the value of  $\text{Prob} > z < 0.05$  indicates a non-normally distributed residual. Based on the test results, the value of  $\text{Prob} > z$  of 0.2241 was obtained, which is greater than 0.05, so that  $H_0$  is accepted and the residuals of the regression model are declared to be normally distributed. Thus, the normality assumption has been met. Together with the absence of symptoms of multicollinearity and autocorrelation and the use of robust standard errors to handle heteroscedasticity, the results of the diagnostic test indicate that the regression model is suitable for use in the analysis and hypothesis testing stages.

**Table 8. Normality Test Results**

| Variabel | Obs | z     | Prob < z |
|----------|-----|-------|----------|
| Res      | 31  | 0.758 | 0.22408  |

### Discussion

United States GDP per capita has a positive and significant effect on the competitiveness of Indonesian knitted women's clothing exports at the 5 percent level. The  $\ln\text{GDPPCUS}$  coefficient of 0.4243 indicates that a 1 percent increase in United States GDP per capita can increase the RSCA by 0.0042 points, *ceteris paribus*. This suggests that increased income and purchasing power of the United States can increase demand for Indonesian knitted women's clothing products. This finding is in line with international trade theory and research. Irvansyah et al. (2020) which shows that the GDP per capita of the destination country has a positive effect on Indonesian textile exports.

*Real Exchange Rate* (RER) has a negative and significant effect on the competitiveness of Indonesian knitted women's clothing exports at the 5 percent level. The  $\ln\text{RER}$  coefficient of -0.3349 indicates that a 1 percent increase in RER can reduce the RSCA by 0.0033 points, *ceteris paribus*. This result indicates that the rupiah depreciation has not been able to increase export competitiveness because the Indonesian textile and textile industry still relies on imported raw materials, so an increase in RER can increase production costs. This finding differs from Irvansyah et al. (2020) who found that the exchange rate had a positive effect on Indonesian textile exports.

The United States import tariff for HS 6104 has a negative and significant effect on Indonesia's export competitiveness at the 5 percent level. The  $\text{TARIFF}$  coefficient of -12.7793 indicates that a 1 percentage point increase in tariffs can reduce the RSCA by 0.128 points, *ceteris paribus*. This indicates that tariff increases increase the relative price of Indonesian products in the United States market, thereby reducing export competitiveness. This finding is in line with international trade theory and research. Irvansyah et al. (2020) which shows that tariffs have an impact on Indonesian textile and clothing exports.

The value of United States imports for HS 6104 from the world does not significantly influence the competitiveness of Indonesian knitted women's clothing exports. The coefficient of  $\ln\text{IMPUS6104}$  of -0.0765 indicates that a 1 percent increase in the value of United States imports is estimated to reduce the RSCA by 0.0008 points, but this effect is not statistically significant. This condition indicates that the increase in demand for HS 6104 in the United States has not directly improved Indonesia's competitive position because the growth in demand is also contested by competing countries. The insignificant effect may occur because the increase in United States imports reflects an increase in

demand for products from all supplier countries, not specifically for Indonesian products, so that increased market demand does not always result in an increase in Indonesia's relative advantage. This finding confirms that the size of market demand alone is not enough to increase competitiveness, without being followed by Indonesia's ability to increase exports and market share relative to competing countries.

## Conclusion

In general, the competitiveness of Indonesian knitted women's clothing (HS 6104) exports to the United States during the 1994–2024 period indicates a relatively strong position. The RSCA value is consistently above zero, indicating that Indonesia has a comparative advantage in this commodity, although the level of competitiveness fluctuates throughout the study period. This condition indicates that Indonesia is able to maintain its comparative advantage in the United States market amidst the dynamics of international trade.

The estimation results show that the United States GDP per capita has a positive and significant effect on Indonesia's export competitiveness. This indicates that increasing income and purchasing power of the United States can expand market opportunities for Indonesian knitted women's clothing products. Meanwhile, the Real Exchange Rate has a negative and significant effect, indicating that changes in the real exchange rate do not always increase competitiveness because the Indonesian textile industry's dependence on imported raw materials can increase production costs when the rupiah depreciates. The United States import tariff also has a negative and significant effect, so that increasing tariffs can reduce the competitiveness of Indonesian products by increasing relative prices in the United States market.

The value of global imports of HS 6104 from the United States did not significantly impact Indonesia's export competitiveness. This indicates that increased demand from the United States market does not automatically improve Indonesia's position, as competing countries also capitalize on the growing demand. Therefore, the competitiveness of Indonesian knitted women's apparel exports is more influenced by the economic conditions of the destination countries, the real exchange rate, and tariff policies than by the overall increase in US import demand.

## Policy Implications

The government needs to strengthen the competitiveness of the textile and apparel industry by strengthening upstream industries, increasing production efficiency, and strengthening the domestic supply chain. These policies are crucial to reducing dependence on imported raw materials, which can increase production costs when exchange rates fluctuate.

Industry players need to improve competitiveness through product quality, design innovation, production efficiency, and technology utilization, along with market diversification to reduce dependence on specific markets. Increasing added value is also necessary so that Indonesian products are not only competitive on price but also able to maintain their position in the international market. The government also needs to strengthen trade cooperation to reduce tariff barriers and increase market access for Indonesian textile products. Improving compliance with US market quality, sustainability, and technical requirements is also crucial to strengthening Indonesia's position amidst competition with major exporting countries.

Further research can expand the analysis by adding variables such as non-tariff measures, logistics costs, labor productivity, FDI, and industrial value added, as well as using a wider scope of destination countries or econometric methods to obtain a more comprehensive picture of the determinants of export competitiveness.

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