Agro Bali : Agricultural Journal
Vol. 9 No. 1: 158-166, March 2026

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

Determinants of Muntok White Pepper Export Value to Singapore and the United States

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Article history: submitted: January 14, 2026; accepted: March 31, 2026; available online: April 10, 2026

Abstract. This study analyzes the factors influencing the export value of Muntok White Pepper (MWP) from the Bangka Belitung Islands Province to its main export destinations, Singapore and the United States, from 2010 to 2023. Panel data regression with a fixed effects model is used to combine production, exchange rate, and domestic price variables with export prices and trade policies. The analysis results indicate that production, exchange rate, export price, and non-tariff barriers (NTB) policies play a significant role in affecting export value, while domestic prices do not exert a significant influence. Elasticity analysis results in the exchange rate being the most responsive factor in influencing export value. Methodologically, this study presents the interpretation of panel data regression coefficients based on elasticity to measure export responsiveness, an approach not commonly applied in agricultural trade analysis. Contextually, this study emphasizes the strategic role of Muntok White Pepper as a geographically indicated commodity in supporting the competitiveness of Indonesian spice exports. These findings provide empirical evidence and policy insights for strengthening export resilience through increased production, exchange rate management, and compliance with international trade standards.

Keywords: Bangka Belitung; elasticity; export; Muntok White Pepper

1. Introduction

Pepper (*Piper nigrum L.)* is among the primary commodities of the plantation subsector which has great potential in contributing to national foreign exchange earnings, together with other key commodities, such as palm oil, rubber, coffee, and tea. In 2020, Indonesia had the world's largest pepper cultivation area, covering 198,222 hectares and producing a total of 89,041 tons. However, despite having a very large productive planting area, Indonesia's pepper production is still lower compared to other producing countries such as Vietnam and Brazil, which in 2020 total production reached 270,192 tons and 114,749 tons, respectively (Center for Agricultural Data and Information Systems, 2020).

Indonesia has seven main pepper-producing provinces, namely Lampung, South Sumatra, West Kalimantan, East Kalimantan, Bangka Belitung Islands, Southeast Sulawesi and South Sulawesi, with a contribution of around 90.26% to total national production. The Bangka Belitung Islands and Lampung provinces are the main centers, with most of their production exported. These two regions are also globally known as producers of two superior pepper varieties: Muntok White Pepper from Bangka Belitung and Lampung Black Pepper from Lampung Province. The reputation of Muntok white pepper is widely known, along with Bangka Belitung's role as the oldest pepper production center in Indonesia.

Based on Indonesian Plantation Statistics (2020), Bangka Belitung and Lampung are the two main national pepper producers, contributing 38.02% and 16.65%, respectively, during 2015–2020. White pepper has a higher economic value than black pepper due to its relatively higher price (Shaliha, 2017). The international price of white pepper reached USD 6,379/MT in August 2022, with Bangka white pepper recording the highest price at USD 6,450/MT (Ministry of Trade, 2022). In addition, global demand continues to grow, driven by the expansion of the spice and pharmaceutical industries (FAO, 2017). Exports, as a component of trade activities, play a crucial role in stimulating a country's economic

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

growth (Abogan, Akinola, & Baruwa 2014; Matandare, 2017).

Bangka Belitung still exports white pepper in primary form or raw materials in the form of seeds or grains. Based on data from the Pepper Management, Development and Marketing Agency (BP3L) of the Bangka Belitung Islands Province, this commodity had an export value of USD 96,070.20 in 2014. Based on information provided by the Central Statistics Agency of Bangka Belitung Islands Province, Muntok white pepper is distributed to various international markets, with Singapore, Vietnam, and the United States as the main destinations during 2010–2023.

Among these markets, Singapore and the United States represent strategic export destinations due to their high import demand. However, export performance to both countries has shown a declining trend. Export volume to Singapore decreased significantly from 1,828,501 kg in 2017 to 308,000 kg in 2023, while exports to the United States declined from 1,685,968.7 kg in 2019 to 891,000 kg in 2023. The reduction in export volume is affected by several interconnected factors. As reported by the Central Statistics Agency (2023), white pepper prices declined sharply from IDR 160,000.00/kg in 2016 to IDR 40,000.00/kg in 2021. Price plays a crucial role in determining trade flows and export performance (Riyani et al., 2018). Furthermore, price instability may reduce farmers' incentives to maintain production, thereby affecting export supply (Ginting (2014).

Several previous studies have analyzed agricultural commodity exports. Susilawati (2017) found that economic distance, GDP per capita, prices, and population significantly influence Indonesian pepper exports, while the exchange rate does not. Wardani and Sunyigono (2021) showed that exchange rates and RCA significantly affect exports to India. Riani (2023) emphasized the role of exchange rates as a key determinant, while Xu et al., (2023) used panel regression to analyze export potential across APEC countries.

Despite these contributions, existing studies exhibit several limitations. First, most studies analyze pepper exports in aggregate or focus on specific markets without capturing bilateral dynamics in major importing countries such as Singapore and the United States. Second, there is limited integration of domestic structural variables such as production, domestic prices, and export prices within a single analytical framework, particularly using panel data approaches. Third, studies specifically addressing Muntok White Pepper from Bangka Belitung remain scarce, despite its global recognition and unique market positioning.

This study offers both contextual and methodological novelty. Contextually, it focuses specifically on Muntok White Pepper from Bangka Belitung and its two main export destinations, which have been underexplored in previous research. Methodologically, this study integrates competitiveness indicators with key macroeconomic and trade variables in a panel data regression framework to provide a more comprehensive analysis of export performance.

Based on these gaps, this study aims to analyze the factors influencing the export performance of Bangka Belitung white pepper in its main destination markets. The objectives of this study are as follows: 1) To analyze the export performance of Muntok White Pepper in Singapore and the United States, 2) To identify the factors influencing the export value of Muntok White Pepper in these markets, 3) To examine whether production, exchange rates, domestic prices, export prices, and competitiveness significantly affect export performance.

This study hypothesizes that production, exchange rates, domestic prices, export prices, and dummy non-tarief barrier policy have a significant effect on the export value of Bangka Belitung white pepper. This research contributes to the literature by providing a more focused and integrated

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

analysis of white pepper exports at the regional and bilateral levels. The findings are expected to support policymakers in formulating strategies to enhance export competitiveness and improve the sustainability of white pepper production in Bangka Belitung.

2. Materials and Methods

Types and Sources of Data

This study adopts a quantitative approach using secondary panel data, which combines time-series and cross-sectional observations. The cross-section data covers the two main destination countries for Muntok White Pepper (MWP) exports, namely Singapore and the United States. Time series data consists of annual data from 2010–2023 (14 years).

The HS code used is 0904.11.10 (white pepper, neither crushed nor ground), representing white pepper in seed form. The data used in this study were derived from official sources, namely the Central Statistics Agency (BPS), World Bank, and Trade Map. Export value (USD) is the dependent variable used. Meanwhile, production volume (tons), the rupiah exchange rate (Rp/USD), domestic price (Rp/Kg), export price (USD/ton), and non-tariff barrier trade policy (dummy variable) are the independent variables.

The selection of variables is grounded in international trade theory and empirical studies. Production volume represents supply capacity, where higher production is expected to increase export availability (supply-side theory). The exchange rate reflects price competitiveness in international markets; depreciation of the domestic currency tends to stimulate exports (Krugman & Obstfeld, 2009). Domestic price captures internal market conditions, where higher domestic prices may reduce export supply due to stronger domestic absorption. Export price represents international price competitiveness and directly affects demand in destination markets (Riyani et al., 2018). The non-tariff barrier (NTB) dummy variable reflects trade restrictions that may hinder export flows, consistent with trade barrier theory.

Data Analysis Method

Analyzed Panel Data Regression

Factors influencing the export value of Muntok white pepper were examined using panel data regression, supported by StataMP 17 software. Panel data regression analysis combines observations from multiple individual entities over time, each of whom is observed over several consecutive time periods (Baltagi, 2005). The panel data regression framework applied in this research can be represented mathematically in Equation 1.

$$NEit = \alpha + \beta 1\, PRODit + \beta 2\, NTit + \beta 3\, HDit + \beta 4\, HEit + \beta 5\, DUMMYit + eit \quad \ldots\ldots 1)$$

Where:
NE_{it} represents the dependent variable, which is the export value of Bangka Belitung's white pepper to Singapore and the United States.
The independent variables are defined as follows:
$PROD_{it}$ is the production volume of Bangka Belitung's white pepper,
NT_{it} is the rupiah-to-US dollar exchange rate,
HD_{it} is the domestic price of white pepper,
HE_{it} is the export price, and;
$DUMMY_{it}$ is the presence of a non-tariff barrier policy, taking a value of 0 if such a policy is implemented and 1 otherwise.
The parameter β is the estimated coefficients,
i is the destination countries (Singapore and the United States),
t is the time period from 2010 to 2023.
α is the constant term (intercept), and;
e_{it} is the stochastic error term in the regression model.

This study uses a relatively small sample size (2 cross-sectional units and 14 time periods, resulting in 28 observations). Therefore, the estimation results should be interpreted with caution. The limited number of cross-sections may reduce the

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

generalizability of findings and affect statistical power. However, the use of panel data helps improve estimation efficiency by combining cross-sectional and time-series variation (Baltagi , 2005).

Potential endogeneity issues may arise in this model, particularly due to simultaneity between export value and explanatory variables such as export prices and production. For instance, higher export demand may influence prices and production decisions, leading to reverse causality. Although this study employs standard panel regression techniques, it acknowledges that the absence of instrumental variables may limit the ability to fully address endogeneity bias. Therefore, the results are interpreted as associative rather than strictly causal relationships.

According to Widarjono (2007), three models are commonly used in panel data estimation: the Common Effects Model (CEM), Fixed Effects Model (FEM), and Random Effects Model (REM). Model selection is conducted through the following tests:

1) Chow Test

Diputra et al., (2012) stated that the Chow test is used to compare CEM and FEM. If the p-value < 0.05, FEM is preferred; otherwise, CEM is selected.

2) Hausman Test

This test compares FEM and REM. If the p-value < 0.05, FEM is preferred; otherwise, REM is more appropriate.

3) Lagrange Multiplier (LM) Test

This test compares CEM and REM. If the p-value < 0.05, REM is preferred; otherwise, CEM is selected.

Classical assumption tests were performed to confirm the reliability of the regression model, including normality, multicollinearity (VIF), autocorrelation (Wooldridge test), and heteroscedasticity (Breusch-Pagan test). Model validity was also assessed using the F-test, t-test, and coefficient of determination (R^2) (Ghozali (2013);Widarjono (2007).

Analyzed Elasticity

The elasticity analysis aims to measure the responsiveness of export value to changes in independent variables. An elasticity value greater than one indicates elastic response, while a value less than one indicates inelastic response. The elasticity concept is derived from microeconomic theory, particularly demand and supply responsiveness, which measures the percentage change in a dependent variable due to a one percent change in an independent variable (Nicholson & Snyder, 2012). In the context of international trade, elasticity reflects how sensitive export performance is to changes in economic variables such as prices, production, and exchange rates.

The equation of elasticity in economics is mathematically presented in Equation 2.

$$Es = \beta_n \times \left(\frac{\bar{X}_n}{\bar{Y}}\right) \ldots\ldots\ldots\ldots\ldots\ldots 2)$$

Where:

E_s = elasticity
β_n = the regression coefficient of the independent variable
$\bar{Y}$ = the mean value of the dependent variable
$\bar{X}_n$ = the mean value of the independent variable

This transformation allows the regression coefficients to be interpreted in economic terms, providing insight into whether export performance is highly sensitive or relatively stable in response to changes in key determinants.

3. Results and Discussion

This section discusses the results of the panel data regression analysis conducted to determine the factors influencing the export value of Muntok White Pepper (MWP) to Singapore and the United States. The discussion is structured sequentially, beginning with model selection and diagnostic testing, followed by regression estimation results with a clear distinction between statistical and economic

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

significance, and concluding with elasticity analysis to assess responsiveness.

Based on the model selection results in Table 1, the Chow test yields an F-statistic of 15.74 with a probability value of 0.0038, which is below the 5% significance level. This indicates that the Fixed Effects Model (FEM) is more appropriate than the Common Effects Model (CEM). Furthermore, the Hausman test produces a chi-square value of 7.37 with a probability of 0.0066, confirming that the FEM is preferred over the Random Effects Model (REM). Thus, the FEM is selected as it is able to control for unobserved heterogeneity across countries and provide consistent parameter estimates. All estimation and diagnostic results are consistently presented in Tables 1–3, including test statistics, probability values, and decision rules to ensure clarity and transparency.

Table 1. Results of Panel Data Model Selection Testing (CEM vs FEM vs REM)

Test type	Comparison purposes	Statistical values	Prob.	Decision	Selected models
Chow test	CEM vs FEM	F(1, 20) = 15.74	0.0038	Reject H_0	FEM
Hausman test	FEM vs REM	Chi2(01) = 7.37	0.0066	Reject H_0	FEM

Source: data processed using stataMP 17 software (2025)

The diagnostic tests show that the model satisfies key classical assumptions. The multicollinearity (Table 2) test indicates that all Variance Inflation Factor (VIF) values are below 10, with an average of 1.65, suggesting no serious multicollinearity problem. The Modified Wald test for heteroscedasticity produces a probability value of 0.4468, which exceeds the 5% threshold, indicating homoscedastic residuals. These results suggest that the model is statistically reliable, although they do not fully eliminate the possibility of estimation bias.

Table 2. Multicollinearity Test (Correlation Matrix)

Variables	VIF	1/VIF
Prod	1.18	0.8339
NT	1.92	0.1579
HD	1.88	0.2133
HE	1.39	0.4949
Dummy	1.87	0.2261
Mean VIF	1.65	

Source: data processed using stataMP 17 software (2025)

The regression results presented in Table 3 show an R-squared value of 0.7894, indicating that approximately 78.94% of the variation in export value can be explained by the independent variables included in the model. However, this value should be interpreted cautiously, as a high R-squared does not necessarily imply that the model is correctly specified or that the relationships are causal. The F-statistic value of 15.74 with a probability of 0.0000 indicates that all independent variables jointly have a statistically significant effect on export value. In interpreting the results, it is important to distinguish between statistical significance, which reflects the reliability of the estimated relationship, and economic significance, which reflects the magnitude and practical importance of the effect.

The production variable shows a probability value of 0.073, indicating significance at the 10% level, which suggests relatively weak statistical significance. The positive coefficient indicates that higher production is associated with increased export value. From an economic perspective, this implies that increasing production capacity contributes to export performance, although the relatively weak statistical significance suggests that this effect is not consistently strong. This finding is consistent with Ridha et al., (2019) & Fitri & Purbadharmaja (2015).

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

However, it differs from studies that identify production as the dominant determinant, indicating that supply-side effects may be influenced by external demand conditions and trade constraints.

Table 3. Estimation Results of Factors Influencing MWP Export Value

Variables	Coefficient	Robust Std. Error	t-Statistic	Prob.
K	1618172	1521945	1.06	0.300
Produksi	315.8983*	167.2686	1.89	0.073
Nilai Tukar	2814.627**	910.0724	3.09	0.006
Harga Domestik	120.3556	84.89507	1.41	0.171
Harga Eksor	866197.2**	362975.3	2.39	0.027
Dummy NTB	1.75e+07***	3339883	5.23	0.000
R-Squared	0.7894			
F-statistic	15.74			
Prob (F-statistic)	0.0000			

Note: Statistically significant at α=1% level (***), Significant at α=5% level (**), Significant at α=10% level (*)

The exchange rate variable is statistically significant at the 1% level, with a probability value of 0.006 and a positive coefficient. This indicates that depreciation of the rupiah is associated with an increase in export value due to improved price competitiveness. Economically, this finding supports the Marshall-Lerner condition theory (Caves et al., 2002). Nevertheless, previous studies such as, Susilawati (2017) found that exchange rates do not always have a significant effect, suggesting that the impact of exchange rates may depend on market structure, contract systems, and commodity characteristics.

The domestic price variable is not statistically significant, as indicated by a probability value of 0.171. This suggests that domestic price fluctuations do not have a systematic effect on export value. This result can be explained by weak price transmission between domestic and international markets, the dominance of export contracts based on international prices, and inefficiencies in the marketing chain (Fazaria et al., (2016). This finding contrasts with Riani (2023), indicating that the influence of domestic prices may vary depending on the degree of market integration.

The export price variable is statistically significant at the 5% level, with a probability value of 0.027 and a positive coefficient. This indicates that higher export prices are associated with higher export value, although this relationship may reflect price effects rather than increases in export volume. This finding differs from Wardani and Sunyigono (2021), suggesting that the responsiveness of export value to prices may vary across markets and time periods.

The non-tariff barrier (NTB) dummy variable is highly significant, with a probability value of 0.0000. The positive coefficient indicates a relationship between NTB policies and export value. This result should be interpreted cautiously, as it suggests that exporters who are able to comply with standards may maintain export performance. However, other studies (Zainuddin et al., 2020; Liu et al., 2019), have found negative effects, indicating that the impact of NTBs depends on the ability of exporters to meet technical requirements. While statistical significance indicates whether a variable has a measurable effect, economic significance reflects the magnitude and practical importance of that effect. Therefore, both aspects are considered in the interpretation below.

Elasticity analysis is used to measure the responsiveness of export value to changes in independent variables. Unlike regression coefficients, elasticity provides an economic interpretation of how sensitive export value is to changes in each variable. The results show that the production variable has an elasticity value of 1.0921, indicating an elastic response. However, this result should be interpreted alongside its relatively weak

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

statistical significance. The exchange rate variable has an elasticity value of 3.6635, indicating a highly elastic response. This suggests that exchange rate fluctuations have a strong association with export performance, although this may reflect short-term price effects rather than long-term structural competitiveness. Meanwhile, the export price variable has an elasticity value of 0.7833, indicating an inelastic response, which suggests that export value is relatively less sensitive to price changes, possibly due to stable demand or contractual pricing mechanisms.

Table 4. Elasticity of Bangka Belitung White Pepper Exports

Variables	Coefficient	Ȳ	X̄	E_s
Produksi	315.898	8484590.323	29332.481	1.092
Nilai Tukar	2814.627	8484590.323	11043.396	3.663
Harga Eksportir	866197.2	8484590.323	7.672	0.783

Note:
Ȳ = average of dependent variable
X̄ = average of independent variable
E_s = variable elasticity value

Based on these findings, several policy implications can be proposed. First, efforts to increase production through productivity improvement, replanting programs, and farmer capacity building are essential to strengthen export supply. Second, although exchange rate depreciation can enhance export competitiveness, reliance on exchange rate movements alone is not sustainable; therefore, exporters should adopt risk management strategies such as market diversification and financial hedging. Third, improving the efficiency of the domestic marketing system is necessary to strengthen price transmission between domestic and international markets. Fourth, compliance with international standards should be enhanced through certification, quality control, and traceability systems to address non-tariff barriers. Finally, developing value-added products is crucial to reduce dependence on raw exports and increase export value in the global market.

Overall, the results indicate that exchange rates, export prices, and trade policies are key determinants of export value, while production has a moderate influence and domestic prices do not show a significant effect. However, these findings should be interpreted as associative relationships rather than causal conclusions, given the limitations of the data and methodology used in this study.

4. Limitations and Future Directions

This study provides a strong empirical contribution in identifying the main factors influencing the export value of Muntok White Pepper (MWP) to Singapore and the United States through a panel data regression approach and elasticity analysis. Focusing on two primary destination countries allows for a more in-depth analysis of the market strategies that have played a significant role in the Bangka Belitung white pepper trade. In the future, research coverage could include other export destination countries to broaden the perspective and expand the international trade context.

The use of annual secondary data for the 2010–2023 period is effective in capturing the medium and long-term structural relationships between economic variables and export values. Further research development could utilize higher frequency data or more detailed trade policy measurements to gain a more comprehensive understanding. Furthermore, the synthesis of a qualitative approach and application of a more dynamic econometric model have the potential to strengthen the analysis. Thus, this research provides a relevant and solid foundation for further research aimed at strengthening the competitiveness and sustainability of Muntok White Pepper exports in the global market.

5. Conclusion

The results of this study indicate that exchange rates, export prices, and non-tariff

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

barrier policies are statistically significant determinants of the export value of Bangka Belitung white pepper to Singapore and the United States, while production shows a moderate effect and domestic prices are not statistically significant. The model explains a substantial proportion of export variation; however, the results should be interpreted as associative rather than causal relationships. This study contributes to the literature by providing a focused analysis of Muntok White Pepper exports at the bilateral level and by integrating production, price, exchange rate, and trade policy variables within a panel data framework, offering a more comprehensive understanding of export performance in key destination markets. The findings imply that improving export performance requires strengthening competitiveness through productivity enhancement, maintaining price competitiveness, and ensuring compliance with international trade standards, rather than relying solely on exchange rate movements.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this article, the author used generative AI (ChatGPT) to help improve grammar and manuscript. All scientific content, data collection, data analysis, interpretation of results, and conclusions were entirely handled by the authors. After making corrections with generative AI, the author carefully checked and adjusted the article and took full responsibility for the content of the publication.

Authorship Contribution Statement

Lingga Saptarini formulated the research framework, collected and processed the data, and prepared the initial draft of the manuscript as part of the final study project. Dwi Rachmina and Suprehatin served as academic supervisors, providing guidance, methodological oversight, and providing important input during the process of developing and refining the article manuscript. All authors have read and agreed to the final draft of this article.

Declaration of Competing Interest

The author declares that there is no conflict of interest in the research and publication of this article.

Acknowledgements

This article is part of LS's master's thesis in the Master of Agribusiness Study Program, Faculty of Economics and Management, IPB University. The author would like to express sincere gratitude to the academic supervisor and all stakeholders who provided valuable input, data, and support throughout the research process.

References

Abogan, O. P., Akinola, E. B., & Baruwa, O. I. (2014). Non-oil export and economic growth in Nigeria (1980-2011). *Journal of Research in Economics and International Finance,* 3(1), 1–11.

Baltagi B. H. 2005. *Econometrics analysis of panel data*. 3rd Ed. Chichester:England.

Caves, R. E., Frankel, J. A., Jones, R. W. (2002), *World trade and payments an introduction (Ninth Ed).* United States: Pearson Education Inc.

Center for Agricultural Data and Information Systems. (2020), *Analysis of Agricultural Commodity Trade Performance*. In Center for Agricultural Data and Information Systems (Vol. 8).

Central Statistics Agency. (2023), *Indonesian Export-Import Statistics 2022*. Available at: https://www.bps.go.id

Diputra T. F., Sadik, K., & Angraini, Y. (2012). Spatial panel data modeling with space and time dimensions. *Indonesian Journal of Statistics*, 17(1), 6-14.

Food and Agriculture Organization. (2017). *World spice production and trade: Challenges and opportunities*. FAO Report.

Fazaria, D. A., Hakim, D. B., & Sahara. (2016). Analysis of pepper price integration in domestic and international markets. *Scientific Bulletin of Trade Research and Development,* 10(2), 225-242. http://jurnal.kemendag.go.id/ index.php/bilp/article/view/55.

Fitri, I. A., & Purbadharmaja, I. B. (2015). The influence of the US dollar exchange rate, production volume, and land area on

e-ISSN 2655-853X
https://doi.org/10.37637/ab.v9i1.2657

Indonesia's pepper export volume. *Development Economics*, *4*(5), 375–389.

Ghozali, I. (2013), *Multivariate analysis application with IBM SPSS 21 program*. Semarang: Diponegoro University Publishing Agency.

Ghozali, I. (2018). *Aplikasi analisis multivariate dengan program IBM SPSS 25*. 9th ed. Semarang: Badan Penerbit Universitas Diponegoro.

Ginting, K. H. (2014). Analysis of the position of Indonesian white pepper in the global white pepper market. Bogor Agricultural University. http://repository.ipb.ac.id/handle/123456789/68354

Li, J., Li, Y., & Dong, Q. (2016). How does monetary policy affect net export in China. *Management & Engineering*, 24 (2016), 101-107. https://doi.org/10.5503/J.ME.2016.24.012

Liu, C., Lin, D., Liu, J., & Li, Y. (2019). Quantifying the effects of non-tariff measures on African agri-food Exporters. *Agrekon*, 58(4), 451–471. https://doi.org/10.1080/03031853.2019.1581624

Matandare, M. A. (2017). Agriculture exports and economic growth in Zimbabwe. *International Journal of Social Science and Economic Research*, 2(12), 5503–5513.

Ministry of Trade of the Republic of Indonesia. (2022), *Price of Bangka Belitung White Pepper: August 2022.* Jakarta: Ministry of Trade of the Republic of Indonesia. http://www.kemendag.go.id.

Ministry of Agriculture. (2020), *Agricultural Commodity Price Report*.

Ministry of Agriculture Regulation. (2012), *Guidelines for Post-Harvest Handling of Pepper*. Jakarta (ID): Ministry of Agriculture.

Riani, N. (2023). Competitiveness of pepper commodities in Indonesia 2018-2022. *Margin: Journal of Islamic Business and Islamic Banking*, 2(2), 115-129. https://doi.org/10.58561/margin.v2i2.98

Ridha, M., Indra, & Safrida. (2019). Factors affecting Indonesian pepper exports. *Scientific Journal of Agricultural Students*, 4(1), 387-400. https://jim.usk.ac.id/JFP/article/view/9936

Riyani, Darsono, & Ferichani, M. (2018). Analysis of demand for Indonesian agricultural commodity exports by the Chinese market. *AGRARIS: Journal of Agribusiness and Rural Development Research*, 4(2), 120-128. http://dx.doi.org/10.18196/agr.4267

Susilawati, D. (2017). Analysis of competitiveness and factors influencing the volume of Indonesian pepper exports in the international market [Thesis]. Jakarta. Syarif Hidayatullah State Islamic University.

Wardani, V. K. A., & Sunyigono, A. K. (2021). Competitiveness and factors influencing Indonesian pepper exports to India. *JEPA: Journal of Agricultural Economics and Agribusiness*, 5(3), 655-666. https://doi.org/10.21776/ub.jepa.2021.005.03.5

Widarjono, A. (2007). *Econometrics: Theory and applications for economics and business, second edition.* Yogyakarta: Ekonisia FE Islamic University of Indonesia.

Xu, H., Nghia, D. T., & Nam, N. H. (2023). Determinants of Vietnam's potential for agricultural export trade to Asia-Pacific economic cooperation (APEC) members. *Heliyon*, 9(2), e13105. https://doi.org/10.1016/j.heliyon.2023.e13105

Zainuddin, M. R. K. V., Sarmidi, T., & Khalid, N. (2020). Sustainable production, non-tariff measures, and trade performance in RCEP countries. *Sustainability*, 12(23). https://doi.org/10.3390/su12239969