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Unleashing Vietnam's rice and coffee exports: Decoding the power of non-tariff measures in the CPTPP market

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Abstract: Rice and coffee are vital commodities in Vietnam's economy. Amidst the evolving dynamics of global trade, the substitution of traditional tariff barriers with non-tariff measures (NTMs) is progressively increasing, and the CPTPP market is not exempt from this trend. Using the gravity model, this study explores the factors influencing Vietnam's rice and coffee exports to the CPTPP market. The study finds that economic factors, such as GDP, have a significant impact on export values. Import tariffs hinder exports, while lower tariffs enhance competitiveness. Geographical distance affects transportation costs and export values. The impact of NTMs on exports is mixed. Vietnam's CPTPP membership offers integration opportunities, albeit gradually. The COVID-19 pandemic has negatively affected exports, highlighting vulnerability. Policy recommendations include addressing adverse NTMs, promoting favorable measures, aligning legislation with the CPTPP, enhancing quality, and researching export markets and regulations. These recommendations aim to improve export performance, mitigate shocks, and leverage trade agreement benefits for the rice and coffee sectors.

Keywords: Non-tariff measures (NTMs), exports, rice, coffee, gravity model, CPTPP.

1. Introduction

Vietnam is a leading exporter of rice and coffee globally. In 2022, it ranked third in rice exports, accounting for 10.6% of the total global rice exports. Similarly, Vietnamese coffee contributed 5.9% to the global coffee export market share (Trademap, 2023).

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a modern free trade agreement signed by 11 member countries in 2018, including Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam. It went into effect in

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Vietnam on January 14, 2019. The CPTPP covers a market with over 502 million people, accounting for more than 13.5% of global GDP and approximately 14% of global trade, valued at USD 10 trillion (World Bank, 2021). While the CPTPP has provided significant opportunities for Vietnam's agricultural exports, particularly in rice and coffee, the value of Vietnam's rice and coffee exports to the CPTPP market remains limited, representing only 8% to 15% of Vietnam's total export value for these commodities from 2012 to 2021 (Trademap, 2023). Aligned with the commitments outlined in the CPTPP, the applied tariffs on Vietnam's rice and coffee exports to the CPTPP market are subject to gradual elimination or reduction based on the agreed timetable. Nevertheless, the CPTPP member countries concurrently implement diverse NTMs to regulate and control the export activities of these agricultural commodities.

Table 1: Tariff reduction commitments of CPTPP countries for Vietnamese rice and coffee

Country	Commitment to rice (HS 1006)	Commitment to coffee (HS 0901)
Australia	0% tariff rate on rice and coffee	
Brunei	0% tariff rate.	Products with HS codes 090111, 090112, 090121, and 090122 will experience gradual tariff reductions over a span of 6 years, eventually reaching 0% in the 7th year. Other types of products will not be subject to tariffs.
Canada	0% tariff rate on rice and coffee.	
Chile	The initial tax rate is 6%, and it will be gradually reduced over 7 years, reaching 0% in the following year.	The tax rate is immediately reduced from 6% to 0% upon the agreement taking effect.
Japan	Under the CPTPP, Vietnam enjoys tariff incentives of 49 yen/kg for a quota of 682,200 tons of rice.	0% tariff rate.
Malaysia	The initial tax rate is 40%, and there is a commitment to gradually reduce tariffs over a 10-year period.	0% tariff rate.
Mexico	Products with codes 100610 and 100620 have a 0% tax rate, while the tax rate for other products will gradually reduce to 0% over a period of 9 years.	Tariffs are gradually reduced over 15 years, reaching 0% in the 16th year for goods with an initial base tariff rate and decreasing from 72% to 36% over the same period for goods with a tariff rate of 72%.
New Zealand	0% tariff rate on rice and coffee.	
Peru	0% tariff rate.	The tax rate will immediately decrease from 9% or 17% to 0% upon the agreement taking effect.
Singapore	0% tariff rate on rice and coffee.	

Source: Compiled by the authors from the WTO.

According to the United Nations Conference on Trade and Development (UNCTAD), NTMs can be categorized into three distinct groups as follows: technical measures, non-technical measures, and export measures. The technical measures group consists of categories such as A - Sanitary and phytosanitary measures (SPS), B - Technical barriers to trade (TBT), and C - Pre-shipment inspection and other formalities. The non-technical measures group includes categories like D - Trade Remedy Measures, E - Licences, quotas, prohibitions and other quantity control measures, F - Price control measures, G - Finance measures, H - Anti-competitive measures, I - Trade-related investment measures, J - Distribution restrictions, K - Restrictions on post-sale services, L - Subsidies (excluding export subsidies), M - Government procurement restrictions, N - Intellectual property, and O - Rules of origin. The export measures group is represented by category P - Export-related measures. These categories provide a

comprehensive framework for analyzing NTMs, with further subgroups referred to as chapters, identified by alphabetic designations (e.g., A, B, C). This classification system facilitates a systematic and structured examination of NTMs, enabling a deeper understanding of their specific characteristics and implications in the context of international trade. The analysis of the effects of NTMs on the export of specific commodities in particular markets is of great significance, given the increasing utilization of these measures by countries worldwide. Several studies have employed rigorous methodologies to investigate the impact of NTMs on agricultural exports in various contexts.

In Vietnam, Nha (2019) employed the gravity model and panel data analysis to examine the factors influencing Vietnam's agricultural exports to the European Union (EU) market during the period of 2005-2016. The results of the estimated model demonstrated that per capita GDP, population, institutional quality, and World Trade Organization (WTO) membership had a positive impact on Vietnam's agricultural export performance. Conversely, factors such as geographical distance and technological disparity exerted a negative influence on the country's agricultural exports.

Similarly, Hien (2022) conducted a regression analysis using the Poisson Pseudo Maximum Likelihood (PPML) method, based on the gravity model, to assess the impact of NTMs on Vietnam's coffee exports. The findings revealed that sanitary and phytosanitary measures had a positive effect on coffee exports, while technical measures and other forms of NTMs acted as potential barriers to trade. Furthermore, the study emphasized the significance of factors such as the importing country's average GDP, exchange rate, geographical distance, and the provisions of free trade agreements in shaping Vietnam's coffee exports.

Saini (2009) supplemented the analysis of NTM impacts on India's textile and apparel exports by incorporating statistical measures of frequency rates and coverage ratios. Utilizing the gravity model, Saini's study revealed that more than 60% of India's textile and apparel exports were affected by NTMs imposed by the United States, EU25, and Canada at different time points.

Similarly, Ven (2017) employed the gravity model and statistical coverage ratios of NTMs to assess the impact of NTMs on Cambodia's agricultural exports. The study found that Cambodia's agricultural products were predominantly affected by NTMs, particularly sanitary and phytosanitary measures (SPS) and technical barriers to trade (TBT), which exhibited higher coverage ratios compared to non-technical barriers (NTBs). Notably, Cambodia's major agricultural products demonstrated the capability to meet the requirements of SPS and TBT measures imposed by trading partners such as the EU, the United States, China, Malaysia, Thailand, Singapore, and Vietnam.

Ningsih and Lilindiasari (2017) investigated the impact of Australian NTMs on Indonesia's exported goods using a gravity regression model. The study found that NTMs, particularly those related to sanitary and phytosanitary measures (SPS), negatively affected Indonesia's export activities to Australia.

Therefore, it is evident from these studies that different countries within the CPTPP region employ various NTMs for agricultural commodities based on their respective goals, such as safeguarding consumer health and safety. Moreover, the impact of NTMs on agricultural exports varies across countries. Thus, this article provides a comprehensive analysis of the factors influencing, and the impact of, NTMs on Vietnam's rice and coffee exports to the CPTPP market, offering valuable implications for the Vietnamese government and exporters in these sectors.

2. Research methodology and model

In order to evaluate the impact of NTMs on Vietnam's rice and coffee exports to the CPTPP market, this study builds upon the research conducted by Saini (2009), Ven (2017), and Hien (2022) with respect to the analysis of NTM coverage ratios. Following their approach, this study employs a calculation method considering various criteria, such as the number of regulations issued, the number of NTMs applied,

and the frequency of NTM application, to determine the quantity of measures implemented within each relevant chapter.

The NTMs selected for analysis are specifically classified under chapters A, B, E, and F, based on the UNCTAD classification system at the HS-6 digit statistical level. This particular categorization is chosen due to the prevalence of these NTMs in relation to Vietnam's rice and coffee exports. By adopting this approach, a comprehensive overview of the NTMs currently imposed on Vietnam's rice and coffee exports can be provided, encompassing both the global scale and the specific context of the CPTPP market.

Additionally, to investigate the factors influencing Vietnam's rice and coffee exports to the CPTPP market, this study employs the gravity model, a widely recognized framework in international trade analysis. Drawing on previous research, the model incorporates a set of variables presented in Table 2. These variables encompass key determinants that have been identified as significant factors shaping the export performance of Vietnam's rice and coffee industries. By utilizing this established model, a comprehensive understanding of the relationships between the identified variables and export outcomes can be attained, thus enhancing the analytical rigor of the study.

Table 2: Variables in the research model

Variable	**Explanation**	**Expected β sign**	**Data sources**	**Reference source**
Dependent variable				
EXijt	Vietnam's export turnover of rice or coffee to country j in the CPTPP market		Trademap	ITC (Hien, 2022)
Independent variables				
GPDit	Vietnam's gross domestic product in year t	+	World Bank	Nha (2017)
GDPjt	Gross domestic product of partner country j in year t	+	World Bank	Nha (2017)
Dij	Distance between Vietnam and partner country j	-	Centre d'Études Prospectives et d'Informations Internationales	Hien (2022), Nha (2017)
Tijt	Tariff rate applied by partner country j to Vietnamese rice and coffee	-	WITS, Macmap.org	Hien (2022)
A, B, E, Ft	Frequency of NTMs by chapter A, B, E, F applied by partner countries to Vietnamese rice and coffee	+ or -	TRAINS	Ven (2017), Ningsih and Lilindiasari (2017)
CPTPPt	Dummy variable representing membership of Vietnam and partner country in CPTPP in year t (1 if CPTPP is signed, 0 otherwise)	+		
COVIDt	Dummy variable representing the period of global impact by COVID in year t (1 if COVID impact, 0 otherwise)	-		

Source: Authors.

To ensure compatibility with the original gravity model and draw upon the empirical insights of prior research, certain variables are subjected to logarithmic transformation. This approach aligns with established practices in the field and enhances the suitability of the model for analysis. The research model is formulated as follows:

$$\ln(EX_{ijt}) = \beta_0 + \beta_1*\ln(GDP_{it}) + \beta_2*\ln(GDP_{jt}) + \beta_3*\ln(Dij) + \beta_4*\ln(T_{ijt} + 1) + \beta_5 A_t + \beta_6 B_t + \beta_7 E_t + \beta_8 F_t + \beta_9 CPTPP_t + \beta_{10} COVID_t + eijt$$

3. Research findings

3.1. Overview of Vietnam's rice and coffee exports to the CPTPP market

Vietnam holds a prominent position as a major exporter of agricultural products both regionally and globally. Notably, rice and coffee constitute the primary agricultural commodities that drive Vietnam's export sector, with substantial growth in export value over recent years. Drawing upon data from Trademap, there have been instances where Vietnam's rice exports to CPTPP partners surpassed the threshold of 570 million USD, accounting for 15.575% of Vietnam's total rice exports (in 2012). Among the CPTPP countries, Malaysia emerges as the largest importing market, commanding over 50% of the region's total rice imports. Furthermore, Vietnam has established itself as the third-largest exporter of rice to Singapore, while the export value to Australia in 2021 reached 25,038 USD, indicating a 2.25-fold increase compared to 2019. Other countries within the CPTPP region, including Canada, Mexico, and Peru, have also displayed promising figures. However, it is noteworthy that Japan remains a discerning market, demanding high-quality products from Vietnam.

Vietnam's coffee exports to the CPTPP market have demonstrated a consistent, positive growth trajectory over a span of five years, culminating in a significant milestone of 371 million USD in 2017. Notably, Vietnam has emerged as the foremost supplier of coffee to both Japan and Malaysia within the CPTPP region. The export value of Vietnamese coffee to Japan witnessed a noteworthy surge of over 24% in 2021 when compared to the figures from 2019, commanding a substantial share of more than 65% in the overall coffee export volume to the entire CPTPP market (Trademap, 2023). Furthermore, Mexico and Canada hold promising potential as prospective import destinations for Vietnamese coffee in the foreseeable future, offering lucrative opportunities for market expansion and diversification.

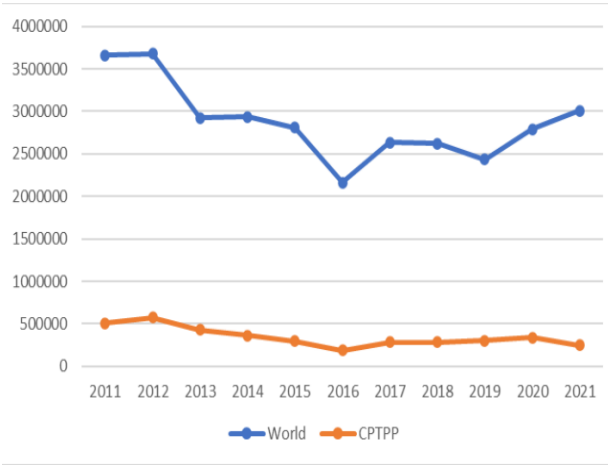

Figure 1: Vietnam's rice export value to CPTPP market and the world in the period 2012-2021.

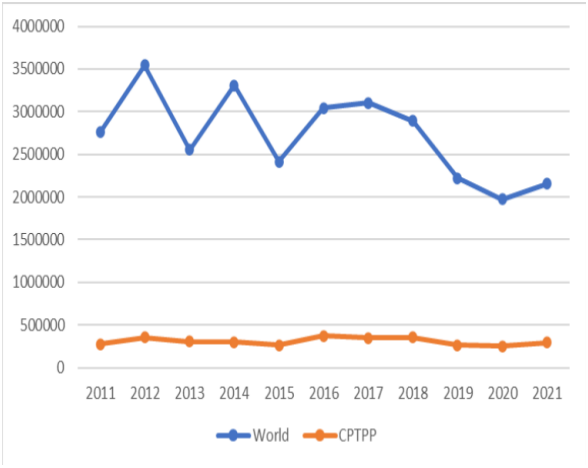

Figure 2: Vietnam's coffee export value to CPTPP market and the world in the period 2012-2021.

Source: Trademap (2023).

These observations underscore the significant presence of Vietnam's rice and coffee in the CPTPP market, characterized by notable growth trajectories across various countries. Nevertheless, challenges persist in meeting the stringent quality requirements imposed by markets such as Japan. This necessitates continuous endeavors to enhance product quality and cater to the specific preferences of diverse importers, thereby consolidating Vietnam's position and competitiveness within the CPTPP market.

3.2. Overview of NTMs applied to Vietnam's rice and coffee

The international landscape, including CPTPP member countries, has witnessed a discernible upward trend in the utilization of NTMs across various product categories, including Vietnam's key agricultural commodities. Of particular significance are rice and coffee, which constitute vital export sectors for Vietnam. The cumulative number of NTMs applied by CPTPP countries to Vietnam's rice and coffee has experienced an expansion from 136 measures in 2011 to 168 measures in 2021. Notably, New Zealand emerges as the country imposing the highest number of NTMs on Vietnam's rice and coffee, with a pronounced increase from 28 measures in 2011 to 38 measures in 2021. Conversely, Australia and Chile have not implemented any NTMs pertaining to Vietnam's primary agricultural products. Among the various NTM chapters, the most frequently employed categories by CPTPP countries are Chapter A, Chapter B, Chapter F, and Chapter E. Remarkably, Chapters A and B collectively account for a substantial 82% of the overall NTM count. Specifically, the prevalent measures include A1 (Import bans and restrictions based on phytosanitary considerations), A3 (Packaging, labeling, and packaging materials), A8 (Conformity assessment); B3 (Packaging, labeling, and packaging materials), and B8 (Conformity assessment) (calculations by the authors from TRAINS database). The cumulative count of NTMs applications on Vietnam's rice and coffee exports to member countries of the CPTPP reached a noteworthy total of 328 instances by the conclusion of 2021. This represents a substantial growth of over 1.3 times when compared to the recorded figure of 235 instances in 2011 (Table 3). The significant increase in NTM applications underscores the escalating prevalence of these regulatory measures, which exert a profound impact on Vietnam's trade in these agricultural commodities within the CPTPP market.

Examining the breakdown of NTM applications across various chapters, it is evident that Chapters A and B continue to dominate as the primary categories, accounting for 61.3% and 21% of the total NTM instances, respectively. It is worth noting that Chapter A demonstrates the most pronounced growth, with 62 instances of increment. Among the CPTPP member countries, New Zealand and Peru emerge as noteworthy nations with the highest utilization of NTMs under Chapter A, experiencing increases of 59 and 30 instances, respectively. This suggests a heightened emphasis on employing NTMs to address phytosanitary concerns and related trade restrictions.

Furthermore, the mounting utilization of measures falling under Chapters E and F indicates an elevated level of concern among CPTPP countries regarding tariff control, fees, and quantity regulation. This trend signifies an increased focus on managing trade-related aspects such as pricing and volume control within the CPTPP framework. Overall, these findings shed light on the evolving landscape of NTM applications on Vietnam's rice and coffee exports within the CPTPP, highlighting the prominence of specific chapters and the growing attention paid to trade regulation and control measures.

3.3. Factors influencing and impacts of NTMs on Vietnam's rice and coffee exports to the CPTPP market

Prior to examining the impact of various factors on the export of rice and coffee from Vietnam, it is imperative to analyze the descriptive statistics of the variables in question (see Table 4). The statistical analysis reveals several noteworthy observations.

The variable lnEXijt is slightly right-skewed, with a mean of 6.7652 and median of 8.0067, showing substantial variability (range:

0-19.814, standard deviation: 6.8266). lnGPDit and lnGDPjt exhibit relatively symmetrical distributions, with means and medians of 26.288, 26.273, 26.805, and 26.495, respectively. lnGDPjt has greater dispersion (standard deviation: 1.5402). lnDij is slightly left-skewed, with a mean of 8.8069 and median of 9.0882, ranging from 7.6212 to 9.8519 (standard deviation: 0.88261). Ln(Tijt) demonstrates substantial variability (mean: 0.96039, median: 0) and a highly skewed distribution (skewness: 3.1436). Variables At, Bt, Et, and Ft have means of 6.7442, 2.3249, 0.44467, and 1.1817, respectively. At displays slight right skewness, while the others are approximately symmetrical. CPTPPt and COVIDt are dummy variables with means of 0.27273 and 0.18182, representing proportions of observations with a value of 1. In conclusion, Table 4 provides a comprehensive overview of the central tendency, dispersion, skewness, and kurtosis of the variables, offering valuable insights into their characteristics and distributions for a deeper understanding of the data.

Table 3: Number of NTM applications for Vietnam's rice and coffee exports by CPTPP countries in 2011 and 2021

Country	2011						2021					
	Total	A	B	E	F	Other	Total	A	B	E	F	Other
Australia	0	0	0	0	0	0	0	0	0	0	0	0
Brunei	28	14	6	3	3	2	29	14	6	3	4	2
Canada	0	0	0	0	0	0	1	1	0	0	0	0
Chile	26	14	10	1	1	0	34	17	14	1	1	1
Japan	2	0	1	0	1	0	13	6	3	0	1	3
Malaysia	33	20	8	2	2	1	40	26	9	2	2	1
Mexico	32	23	7	2	0	0	41	26	9	5	0	1
New Zealand	52	32	9	1	6	4	87	59	12	3	7	6
Peru	30	16	10	0	3	1	48	30	11	0	6	1
Singapore	32	20	5	1	6	0	35	22	5	1	7	0
Total	**235**	**139**	**56**	**10**	**22**	**8**	**328**	**201**	**69**	**15**	**28**	**15**

Source: Calculations by the authors from TRAINS database.

Table 4: Descriptive statistical analysis

Variable	Mean	Median	Minimum	Maximum	Standard deviation	Coefficient of variation	Skewness	Excess kurtosis
lnEXijt	6.7652	8.0067	0	19.814	6.8266	1.0091	0.20845	-1.6137
lnGPDit	26.288	26.273	25.874	26.626	0.23488	0.00893	-0.1597	-1.1357
lnGDPjt	26.805	26.495	23.157	29.467	1.5402	0.05746	-0.5667	0.24148
lnDij	8.8069	9.0882	7.6212	9.8519	0.88261	0.10022	-0.268	-1.5997
Ln(Tijt+1)	0.96039	0	0	10.718	1.9743	2.0557	3.1436	11.927
At	6.7442	7	0	21	5.0726	0.75215	0.29477	-0.3386
Bt	2.3249	2	0	6	2.0036	0.8618	0.48475	-0.8817
Et	0.44467	0	0	2	0.61091	1.3738	1.0413	0.04193
Ft	1.1817	1	0	4	1.2455	1.054	0.52145	-1.2672
CPTPPt	0.27273	0	0	1	0.44559	1.6338	1.0206	-0.9583
COVIDt	0.18182	0	0	1	0.38589	2.1224	1.6499	0.72222

Source: Compiled by the authors based on Stata.

Table 5: GLS regression results

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Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation
Estimated covariances      =       990          Number of obs     =        990
Estimated autocorrelations =         0          Number of groups  =         99
Estimated coefficients     =        10          Time periods      =         11
                                                Wald chi2(9)      =      94.46
                                                Prob > chi2       =     0.0000

------------------------------------------------------------------------------
          Ex |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     lnGDPit |   0.5973101   0.389710     2.27   0.000     0.497310     0.657087
     lnGDPjt |   0.0872293   0.197841    14.24   0.000     0.320319     0.369801
      lnDijt |  -0.2493157   0.046323    -1.84   0.002    -0.159435     0.146733
      lnTijt |  -1.0349721   0.977125    -2.19   0.011    -0.513694    -2.019702
           A |  -0.2013855   0.423397    -6.15   0.000    -0.031397    -0.013972
           B |  -0.1234966   0.310372     6.23   0.014    -0.004326    -0.170914
           E |   0.0086713   0.024973     0.32   0.590    -0.021365     0.031970
           F |   0.0497314   0.029716     5.67   0.000     0.031396     0.087201
      CPTPPt |   0.1742187   0.748930     2.56   0.026    -0.614656     0.781390
      COVIDt |  -0.1579591   0.680367    -2.45   0.031    -0.091345     0.160436
       _cons |  -16.046733   30.21893    -4.59   0.000    25.019844    -14.17652
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Source: Compiled by the authors based on Stata results.

Based on this descriptive analysis, the research team identified the absence of inherent limitations such as autocorrelation and multicollinearity, which motivated the adoption of regression analysis as a method to examine the effects of various factors on the export of Vietnam's primary agricultural commodities to CPTPP markets. Consequently, three regression techniques, namely Ordinary Least Squares (OLS), Random Effects Model (REM), and Fixed Effects Model (FEM), were thoroughly evaluated. After careful consideration, the Fixed Effects Model (FEM) emerged as the most appropriate model for the research dataset, thus serving as the fundamental framework for subsequent analysis. Following model selection, diagnostic tests were conducted to evaluate the presence of potential issues. Notably, heteroscedasticity was detected, indicating non-constant variance within the error term. In order to mitigate this concern, the researchers applied the Generalized Least Squares (GLS) method, which effectively addresses the presence of varying random error variances. By employing GLS, the estimated regression results were obtained, providing valuable insights into the relationship between the examined factors and the export of Vietnam's key agricultural commodities to CPTPP countries.

The estimation results presented in Table 5 provide a foundation for identifying a regression model that elucidates the factors impacting the export of Vietnam's primary agricultural commodities. Grounded in the theoretical underpinnings of the gravity model in international trade, the estimated model offers valuable insights into the determinants of export performance.

$\ln(EX_{ijt}) = -16{,}046 + 0{,}597*\ln(GDP_{it}) + 0{,}387*\ln(GDP_{jt}) - 0{,}149*\ln(Dij) - 1{,}034*\ln(1+T_{ijt}) - 0{,}021*A_t - 0{,}014*B_t + 0.008*E_t + 0{,}057*F_t + 0{,}142*CPTPP_t - 0{,}167*COVID_t$

The examined model demonstrates a within R-squared (R2 within) value of 0.3043, indicating that the independent variables account for approximately 30.43% of the observed variation in the export values of rice and coffee from Vietnam. The impacts of each independent variable on the dependent variable are as follows:

First and foremost, the variable representing GDPit plays a crucial role within the analysis. GDPit serves as a fundamental variable in the

gravity model, a widely utilized framework for studying international trade dynamics. The statistical analysis reveals a P-value below 0.05, indicating the statistical significance of this variable. Additionally, the assessment of multicollinearity through the variance inflation factor (VIF) demonstrates acceptable levels, implying the absence of substantial multicollinearity issues. Notably, the estimated regression coefficient for GDPit exhibits a positive sign, which is consistent with the hypothesized direction of the researchers. Specifically, the coefficient value of 0.597 implies that, while controlling for other factors, a 1% increase in domestic output corresponds to a 0.597% increase in the export values of rice and coffee from Vietnam to CPTPP countries. These findings align with prior empirical investigations conducted by Nha (2019) concerning the analysis of commodity trade dynamics.

Secondly, the GDP of the importing country within the model displays a positive regression coefficient, achieving statistical significance with a P-value below 0.05, and the VIF coefficient remains within acceptable limits. This finding suggests a positive relationship between the export of rice and coffee from Vietnam to CPTPP member countries and the scale and level of economic development within the respective CPTPP economies. This observation is in accordance with economic theory, as an increase in the GDP of partner countries signifies economic growth, leading to an amplified demand for imports from Vietnam. Holding other variables constant, a 1% increase in the GDP of CPTPP member countries would result in a 0.387% increase in the export values of rice and coffee from Vietnam.

Thirdly, the variable Dji, representing geographical distance, exhibits a negative regression coefficient with a P-value below 0.05, indicating statistical significance and aligning with theoretical expectations. The distance variable serves as a proxy for transportation costs, where greater distances entail higher transportation expenses, consequently diminishing the export values of rice and coffee from Vietnam to partner countries. Although the regression coefficient of -0.149 is relatively modest, it aligns with numerous studies employing the gravity model in the field of international trade, including the research conducted by Nha (2019), which has demonstrated that geographical distance no longer poses a substantial barrier in contemporary international trade.

Fourthly, the variable tariff exhibits a negative regression coefficient of -1.034, in line with the hypothesized direction and consistent with prior research on the impact of trade barriers on exports, such as the studies conducted by Hien (2022) and Ven (2017). Specifically, while holding other factors constant, a 1% increase in import tariffs on rice and coffee would lead to a 1.034% decrease in Vietnam's export values to CPTPP countries. This finding aligns with the context of the CPTPP, where, between 2011 and 2021, certain countries still imposed tariffs on Vietnamese coffee and rice, with tariff rates decreasing from 40-70% to 15-45% for coffee and from 20-40% to an average of 10-25% for rice. The reduction in import tariffs contributes to cost reduction, fosters increased consumption of Vietnamese agricultural products in foreign markets, and thereby stimulates export development.

Fifthly, the utilization of NTMs in Chapters A and B was found to have a negative impact on Vietnam’s exports to the CPTPP market. Conversely, NTMs in Chapter F were found to have a positive effect on exports to these countries. However, the research findings did not establish a statistically significant impact of NTMs in Chapter E on Vietnam's exports to the 10 CPTPP countries. The statistical analysis revealed that the number of occurrences of NTMs in Chapters A and B had a p-value (T-statistics) below the threshold of 0.05, indicating their statistical significance. These chapters encompass measures aimed at ensuring product standards, human and plant health, and environmental safety. However, it is important to note that certain CPTPP countries have implemented protectionist measures within Chapters A and B, particularly concerning rice and coffee. Consequently, each additional measure introduced from Chapter A resulted in a 0.021% decrease in Vietnam's export value of rice and coffee. Similarly, an increase in measures from Chapter B led to a reduction of 0.014%. While these coefficients may appear relatively small in absolute terms, the larger number of measures within these two chapters

compared to other NTM chapters contributes to their relatively significant overall impact. In contrast, the variable representing Chapter E did not exhibit statistical significance (p-value > 0.05) in the model. Despite Chapter E encompassing NTMs related to import quantities and the theoretical direct impact of these measures on trade value, their limited implementation by CPTPP countries explains the lack of influence on Vietnam's export value of major agricultural products to the CPTPP market. Conversely, the p-value ($p < 0.05$) of the variable associated with Chapter F indicated its statistical significance. This implies that an additional utilization of NTMs under Chapter F in the CPTPP would increase Vietnam's exports to CPTPP countries by 0.057% compared to the scenario where such measures are not employed. However, it is noteworthy that these measures were implemented relatively late for Vietnam's rice and coffee sectors, and their overall implementation within the CPTPP market remain limited. As a result, the observed outcome of this variable does not align with initial expectations. This discrepancy can be attributed, in part, to the positive effects of administrative reforms, improvements in the investment environment, trade liberalization, and commitments within the CPTPP, which have reduced the transaction costs for member countries. Additionally, although the number of measures has increased, the reduced intensity of these measures has led to an overall increase in Vietnam's exports of major agricultural products to the CPTPP market. In conclusion, the impact of NTMs on trade between countries depends on their specific application, as they can either facilitate or hinder trade. Consequently, the coefficients associated with NTM variables can exhibit both positive and negative signs, reflecting the diverse nature of these measures and their effects on trade dynamics.

Sixthly, Vietnam's accession to the CPTPP has provided Vietnam with a range of opportunities in terms of tariff reduction and enhanced market access within the CPTPP. An analysis using regression techniques on the relevant variables yields noteworthy findings that align with expectations based on economic theory. The regression coefficient associated with Vietnam's CPTPP membership exhibits a positive sign and is statistically significant, as indicated by a p-value below the conventional threshold of 0.05. This implies that Vietnam's participation in the CPTPP has not had a substantial impact on the country's export performance, particularly concerning its major agricultural products. Thus, it can be inferred that the anticipated effects of the CPTPP commitments will manifest gradually over an extended period, rather than yielding immediate and easily discernible outcomes.

Lastly, turning attention to the variable representing the COVID-19 pandemic, the regression coefficient assumes a negative value and achieves statistical significance with a p-value below 0.05. This finding is in line with the theoretical expectations posited by the model. Specifically, the coefficient of -0.167 suggests that, while holding other factors constant, Vietnam's export value to CPTPP countries during the pandemic year experienced a decline of approximately 0.167% relative to other years. This outcome corresponds to the empirical reality where the COVID-19 pandemic has caused severe disruptions in global trade dynamics, resulting in significant contractions in the export values of numerous countries, including Vietnam.

4. Conclusion and policy implications

The analysis of Vietnam's rice and coffee exports to the CPTPP market leads to several logical and academically supported conclusions:

First, economic factors play a significant role in export values, as evidenced by the positive relationship between domestic output (GDP) and the GDP of importing countries. This indicates that higher economic activity levels in Vietnam and CPTPP member nations contribute to increased demand for Vietnamese agricultural products.

Additionally, trade barriers, particularly import tariffs, have a negative influence on exports, implying that higher tariff rates hinder export competitiveness and reduce the appeal of Vietnamese rice and coffee in the CPTPP market. The reduction of tariffs provides cost advantages and stimulates export growth. Geographical distance is also a critical factor, with longer distances between Vietnam and CPTPP countries resulting in higher

transportation costs and reduced export values. This highlights the importance of proximity and efficient logistics in facilitating trade. NTMs also shape export performance, with certain measures in Chapters A and B, related to product standards, health, and safety, having an adverse impact. However, NTMs in Chapter F have a positive effect, indicating that specific regulations and standards can enhance product acceptance and market access.

Vietnam's membership in the CPTPP presents opportunities for improved market integration and reduced trade barriers, although the immediate impact on export performance may be limited, with the full benefits expected to materialize gradually over time. Finally, the COVID-19 pandemic has adversely affected Vietnam's exports to CPTPP countries, resulting in a contraction of exports during the pandemic period. This highlights the vulnerability of export-oriented economies to global shocks and disruptions.

Overall, these findings elucidate the complex interplay of economic dynamics, trade barriers, geographical factors, NTMs, and global events in shaping Vietnam's rice and coffee exports to the CPTPP market. Based on these analyses and conclusions, the following policy recommendations can be made:

(1) Diligently monitor and proactively address the adverse effects of NTMs, particularly those outlined in Chapters A, B, and F, which impact the rice and coffee sectors. Efforts should focus on minimizing the detrimental impact of these measures on Vietnam's agricultural exports within the context of the CPTPP.

(2) Promote the comprehensive adoption and effective implementation of NTMs specified in Chapter E, particularly those related to import quantities. By encouraging the utilization of these measures, trade facilitation can be enhanced, thereby bolstering Vietnam's export performance in key agricultural products.

(3) Capitalize on Vietnam's membership in the CPTPP by actively fulfilling commitments and aligning domestic legislation with the provisions of the agreement. This requires harmonizing regulations related to food safety and epidemiological hygiene within the broader CPTPP framework, ensuring coherence and consistency with Vietnam's domestic legal system. Additionally, specific measures should be formulated to address technical barriers to trade (TBTs) and sanitary and phytosanitary (SPS) standards, safeguarding the competitiveness of Vietnamese agricultural products such as rice and coffee by establishing transparent and unambiguous criteria.

(4) Foster close collaboration between the government, relevant ministries, and enterprises to enhance the quality of exported agricultural products. This collaboration should involve comprehensive research to identify and address the underlying causes that impede Vietnamese rice and coffee products from meeting the required standards imposed by NTMs. Furthermore, a meticulous classification of NTMs, adhering to the taxonomy delineated by the UNCTAD, should be undertaken to accurately assess the impact of measures implemented by partner countries on Vietnam's exports.

(5) Conduct thorough research on consumer demand, purchasing trends, import regulations, and customs procedures to promote a comprehensive understanding of export markets and mitigate potential risks. Enterprises should also acquire comprehensive knowledge and understanding of the NTMs enforced by target countries, ensuring strict compliance and developing the necessary expertise to proactively address potential disputes. Efforts should be prioritized to improve the quality of exported rice and coffee products, aligning them with the requirements stipulated in NTMs, particularly those specified in Chapters A and B. Collaboration among industry players is crucial, and comprehensive research initiatives should be undertaken to effectively implement dynamic plant quarantine commitments (SPSs) and technical barriers to trade (TBTs) imposed by partner countries. By adhering to these measures, Vietnamese enterprises can enhance their export competitiveness and ensure compliance with international standards.

These policy recommendations aim to address challenges related to NTMs, leverage CPTPP membership, enhance product quality, and conduct comprehensive research to improve Vietnam's export performance in the rice and coffee sectors while mitigating the adverse effects of external shocks. In summary, the study emphasizes the complex

nature of NTMs and their diverse effects on trade. The findings underscore the importance of targeted policy interventions to address negative impacts, promote the implementation of beneficial measures, and leverage the opportunities offered by trade agreements such as the CPTPP. By adopting appropriate policies, Vietnam can enhance its export performance and effectively navigate the challenges posed by global trade dynamics.

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