ẢNH HƯỞNG CỦA HIỆP ĐỊNH CPTPP TỚI NGÀNH XUẤT KHẨU CÀ PHÊ CỦA VIỆT NAM GIAI ĐOẠN 2013-2023: THÁCH THỨC VÀ CƠ HỘI

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Tóm tắt

Bài nghiên cứu xem xét hiệu suất ngành xuất khẩu cà phê của Việt Nam và tác động của Hiệp định Đối tác Toàn diện và Tiến bộ xuyên Thái Bình Dương (CPTPP) đối với giá trị xuất khẩu cà phê của Việt Nam sang các nước thành viên CPTPP. Áp dụng mô hình trọng lực với ước tính Poisson Pseudo Maximum Likelihood (PPML), nghiên cứu phân tích dữ liệu bảng từ năm

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2013 đến năm 2023 để đánh giá tác động của CPTPP và các yếu tố kinh tế khác ảnh hưởng đến xuất khẩu cà phê của Việt Nam sang các nước thành viên. Các kết quả thực nghiệm chỉ ra rằng CPTPP, khối lượng xuất khẩu, quy mô dân số và GDP của Việt Nam có tác động tích cực đến giá trị xuất khẩu, trong khi khoảng cách địa lý ảnh hưởng tiêu cực đến dòng chảy thương mại. Mặc dù CPTPP tạo điều kiện mở rộng thị trường, nâng cao triển vọng đầu tư và củng cố vị thế của Việt Nam trong thương mại toàn cầu, nhưng nó cũng đặt ra những thách thức đòi hỏi phải điều chỉnh chính sách, cải thiện chất lượng sản phẩm và tăng cường khả năng cạnh tranh. Dựa trên những kết luận này, nghiên cứu đưa ra các lý luận và khuyến nghị để hỗ trợ hoạch định chính sách và nâng cao hiệu quả cho ngành xuất khẩu cà phê của Việt Nam trong khuôn khổ CPTPP.

Từ khóa: CPTPP, xuất khẩu cà phê Việt Nam, PPML, mô hình trọng lượng

THE IMPACTS OF CPTPP ON VIETNAM'S COFFEE EXPORTS FROM 2013-2023: CHALLENGES AND OPPORTUNITIES

Abstract

This paper examines Vietnam's overall coffee export performance and the potential impact of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) on Vietnam's coffee export value to CPTPP member countries. Applying the gravity model with Poisson Pseudo Maximum Likelihood (PPML) estimation, the study analyzes a panel dataset from 2013 to 2023 to assess the effects of CPTPP and key determinants influencing Vietnam's coffee exports to its country members. The empirical findings indicate that the CPTPP, export quantity, population size, and Vietnam's GDP exert a positive influence on export value, while geographic distance negatively affects trade flows. While the CPTPP facilitates market expansion, enhances investment prospects, and strengthens Vietnam's position in global trade, it also poses challenges that necessitate policy adjustments, quality improvements, and enhanced competitiveness. Therefore, this study proposed discussions and recommendations to support policy-making and enhance the efficiency of Vietnam's coffee exports within the CPTPP framework.

Keywords: CPTPP, Vietnamese coffee exports, PPML, gravity model

1. Introduction

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a replacement of the previously negotiated Trans-Pacific Partnership (TPP) after the US withdrawal, between Canada and 10 other countries in the Indo-Pacific: Australia, Brunei, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam (Wu and Chadee, 2022). The economic objective of CPTPP is to create a platform of a deep economic integration and comprehensive free trade agreement.

Vietnam officially signed the CPTPP Agreement on March 8, 2018, in Santiago, Chile and CPTPP officially came into effect for Vietnam on January 14, 2019. In terms of economic development, participating in CPTPP helps Vietnam increase export volume and turnover while expanding the structure of exported goods and also gaining better access to international exporting markets through CPTPP (Oanh, 2019).

Vietnam is the second-largest coffee exporter in the world and plays a crucial role in the global coffee supply chain. Over the past decades, the country has benefited from various trade agreements that have expanded its export markets and increased competitiveness. Among them, the CPTPP agreement has significantly impacted Vietnam's economy by eliminating tariffs and reducing trade barriers.

The CPTPP opens up new export markets for Vietnamese coffee but also poses difficulties regarding quality standards and competitiveness. By analyzing the influence of CPTPP from scientific and practical aspects, this paper examines CPTPP's effects on coffee exports from 2013 to 2023 and provides recommendations. Prior research has interpreted many potential findings about the importance of coffee production and the positive impacts of the CPTPP in Vietnamese good exports but research conducted focuses on coffee exports under the influence and conditions of CPTPP still remain limited. Moroever, the quantitative model of previous studies has faced a hindrance when evaluating a particular product such as coffee, therefore, this research intend to fill into this gap and to find the utmost potential result of CPTPP effect on coffee export value of Vietnam with a solution-oriented framework.

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Thus, summarizing key opportunities and challenges, the study provides strategic recommendations to the government and coffee-exporting companies on how to gain benefits, enhance competitiveness, and achieve sustainable development. Its findings have significant implications for business while offering empirical results for future research on the impact of trade agreements on Vietnam's agricultural production.

The study is structured in a logical framework including 5 sections as follows: Section 2 is the Literature review, Section 3 explains the methodology and data, Section 4 shows the findings as well as discussion about the chances and challenges of Viet Nam based on the analysis, and the final section presents our recommendations for Vietnam exporting strategies.

2. Literature review

2.1. Literature review

Coming into force in Vietnam since the beginning of 2019, the CPTPP agreement's influence has been studied and investigated by many researchers and businesses to have a depth understanding on the proposed future as well as decide the market entry strategies. Textiles and garment businesses have been indicated to attend the international trade fairs in CPTPP member countries to get access to potential market partners along with receiving strong FDI flow (Nguyễn *et al.*, 2022). Similarly, Vietnamese footwear exports study (Nguyễn *et al.*, 2023) concluded that Vietnam will have tariff advantages from the CPTPP rather than non-members due to tariff elimination, hence, domestic enterprises must take into consideration gaining new competitive advantage and enhancing product qualities. Research on future prospects of wooden furniture exports (Nguyễn *et al.*, 2022) has investigated the possibility of the positive effects of the CPTPP in Vietnam's wooden furniture exports in the foreseeable future to the year 2030 and the ability to access the Mexican and Peruvian market. The massive amount of studies' results are on the common ground in terms of affirming the positive impacts of the application of CPTPP agreement on Vietnam exports' products and suggesting advanced empowerment on Vietnamese policy and international business strategies. In addition, Chien-Huei Wu (2022) has done research on the whole Asean countries at the crossroad between CPTPP and RECEP implied that aparting from the aim of accessing American market yet Vietnam's Trans-Pacific Partnership participation should also be understood in the context of its aggressive free trade agreement strategy.

Regarding literature on Vietnam coffee issues, it is obvious that there is a great amount of research on this "niche market" over the last decade (Shively and Ha, 2008; Best, 2014; Ho, John F. and Prabodh, 2024). Coffee production industries surely have favorable conditions in Vietnam exports since it not only plays an important role in Vietnam economy but also supports many farming households in the mountainous areas, yet still has not lived up to its potential and strengths (Duong, 2021). It raises a question about what is the underlying reason for this shortcoming of coffee sector, though Vietnam certainly has both opportunities and challenges in the contest of integrated global economy and "open door" policies with the participation in many international agreements such as the CPTPP, ASEAN Free Trade Agreement (AFTA) and EU-Vietnam Free Trade Agreement (EVFTA).

Therefore, finding the competitive advantage when participating in such international trade fairs in this day and age to find out about its benefits becomes very necessary. The study of Dao Dinh Nguyen (2020) has proved the significant effect of CPTPP on coffee exports. To contribute to that, coffee has been said to be in the top 10 groups and have an export turnover of $2 billion or more, which shows the effect of CPTPP on making export opportunities and boosting domestic production (Anh, Tung and Hien, 2020). Besides, Ha, Nguyen and Bui (2023) has conducted a research on the power of non-tariff measures in the CPTPP market toward Vietnam's rice and coffee products and came to the conclusion that import tariffs has a negative influence on exports which means higher tariff rates limit export competitiveness and reduce the appeal of Vietnamese coffee in the CPTPP market. More specifically, in a CPTPP market, Australia, coffee products have recorded impressive growth due to their strong demand and consumer appeal (Nguyễn et al., 2023).

Although the international trade literature has interpreted many findings related to the Vietnamese products exports with many methods, coffee products per se still have left room to investigate more. The prior research about the influence of CPTPP and the importance of coffee production have been thorough, but changing circumstances related to agriculture products in the context of CPTPP and solution-oriented analysis support a need to examine the impacts of these agreements on coffee exports industries in Vietnam nowadays.

Moreover, quantitative methods still have limitations on the typical data set of a particular product such as coffee, thus raising a need to adapt another model which can fix the problem of

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this econometric model. Therefore, this research paper is interested in filling in these gaps by analyzing the data from only coffee products in the period of 2013-2023 to examine the impact of CPTPP on coffee exports and make recommendations for Vietnamese entrepreneurs.

2.2. Theoretical framework

2.2.1. Overview of CPTPP

CPTPP is a proposed trade agreement under negotiation among the economies of the Asia-Pacific region (Khan, Zada and Mukhopadhyay, 2018). It initially originated from the TPP agreement, which included 12 member countries: the United States, Canada, Mexico, Peru, Chile, New Zealand, Australia, Japan, Singapore, Brunei, Malaysia and Vietnam. The TPP was officially signed on 4 February 2016, and was expected to be effective in 2018.

However, in January 2017, the United States announced its withdrawal from the TPP, casting doubts on the survival of the agreement and the future course of the US international trade rulemaking in Asia-Pacific (Ajibo *et al.*, 2019) and preventing the agreement from meeting the conditions required for the initiated enforcement initially. In November 2017, 11 remaining TPP member countries issued a joint statement, which agreed to change the name of TPP as a comprehensive and progressive agreement for the Trans-Pacific Partnership. CPTPP was officially signed by the remaining 11 member countries in March 2018.

2.2.2. The provisions of CPTPP

The CPTPP agreement consists of 30 chapters, 4 annexes, and several bilateral letters between the CPTPP parties, and aims to establish a new global trade standard by addressing emerging challenges and incorporating five key features. First, it is a broad free trade agreement that establishes a wide range of regulations and standards across various sectors, including goods and services trade, trade remedies, sanitary and phytosanitary measures, technical trade barriers, intellectual property rights (IPR), government procurement, and competition policy (Jiang and Yu, 2021). Second, The CPTPP was set to unlock significant opportunities for its member countries, driving economic growth and expanding market access. It also aimed to generate new prospects for workers and businesses, enhance living standards, provide consumer benefits, reduce poverty, and support sustainable development (Ajibo *et al.*, 2019). Last, with increasing

bilateral and regional trade agreements in the Asia-Pacific, global trade rules have become increasingly fragmented and complex. The CPTPP helps to attain greater harmony and coordination by promoting a shared approach to trade and investment through regional cooperation (Capling and Ravenhill, 2011).

As estimated by the Multilateral Trade Policy Department (Ministry of Industry and Trade), CPTPP members have reaffirmed the market access commitments for goods, including coffee from the TPP under the CPTPP agreement. As a result, import tariffs will be eliminated for almost the entire import tariff schedule of Viet Nam. According to the commitment, CPTPP countries have pledged to completely eliminate between 97% and 100% of import tariff lines for goods originating from Vietnam, depending on the specific commitments of each member country.

Country	Tariff reduction for coffee (HS 0901)
Australia	0% tariff rate
Brunei	Tariffs will be reduced from 11¢/kg (HS codes: 090111, 090112) or 22¢/kg (HS codes: 090121, 090122) to 0%.
Canada	0% tariff rate
Chile	Tariffs will be reduced from 6% to 0%.
Japan	Tariffs will be reduced from 12% to 0% for products with HS codes: 090190200, 090122000, 090121000
Malaysia	0% tariff rate
Mexico	Tariffs will be reduced from 20% to 17% for products with HS codes 090111, 090112
New Zealand	Tariffs will be reduced from 5% to 0% for products with HS codes 09012100, 09012200, 09019090
Peru	Tariffs will be reduced from 6% or 11% to 0%.
Singapore	0% tariff rate

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

Source: Author's compilation from ITC

In addition to tariff reduction, coffee is among the goods under the WO (Wholly Obtained) origin of the CPTPP Agreement. This means coffee must be produced, harvested, or caught within the territory of the CPTPP partner countries in order to be considered as originating goods and to benefit from preferential tariff treatment under the agreement (Multilateral Trade Policy Department, 2021).

The Sanitary and phytosanitary (SPS) in CPTPP are non-tariff measures, which aim to protect food safety as well as animal and plant health. Although the SPS Agreement does not restrict countries' rights to implement measures within their territories, it requires that such measures be based on scientific evidence or follow international standards, guidelines, and recommendations as well as must be applied only to the necessary extent, without creating trade barriers or discriminating between domestic and foreign products (TPP, Chapter 7)

*2.2.3. The situation of coffee export in Vietnam*

As Vietnam is one of the leading countries in exporting agricultural products, coffee is considered an important export item. The main type of Vietnamese exported coffee is Robusta coffee, besides Arabica coffee and processed coffee products such as instant coffee. During the period between 2013 and 2023, Vietnam still affirmed its position as one of the top five countries exporting the most amount of coffee around the world. In 2022, Vietnam is the second largest coffee exporter in the world after Brazil, with the amount of coffee exported reaching more than 1.78 million tons of coffee, earning an export turnover of more than 4 billion USD with an average export price of 2,293 USD/ton, representing over 10% of the country's total agricultural export value (Nguyễn, Nguyễn and Hoàng, 2024).

Before the CPTPP came into effect, Vietnam had exported coffee to its member countries but did not gain much market share in most of these nations. Competition from other coffee exporting countries such as Colombia and Indonesia, along with tariff and non-tariff barriers, limited our country's ability to access and expand its market share in these markets. Of which, Japan was the leading country in importing coffee from Vietnam in the CPTPP countries, with an import value of 188 million USD, accounting for 5.68% of Vietnam's coffee exports in 2018. In

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other CPTPP markets, Vietnamese coffee only accounted for a small share of less than 3%, such as Malaysia - 2.43%, Australia - 1.12% in 2018 (OEC, 2018).

After CPTPP officially took effect in Vietnam in 2019, Vietnam's coffee exports to CPTPP countries have gradually recorded significant growth, especially in large coffee consuming markets such as Japan, New Zealand, and Australia.

Figure 1: The growth rate of Vietnam's coffee export turnover to CPTPP markets during the period 2020-2023.
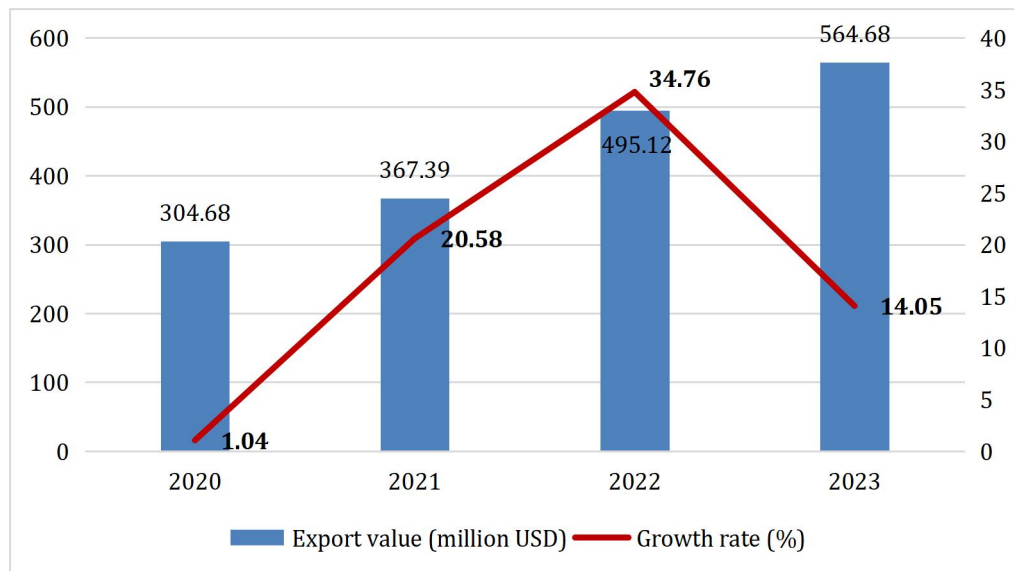
Source: Calculation from statics of General Department of Vietnam Customs

Figure 2: Vietnam's coffee exports to the Japanese market in the period 2019 - 2023 (Unit of measure: million USD)

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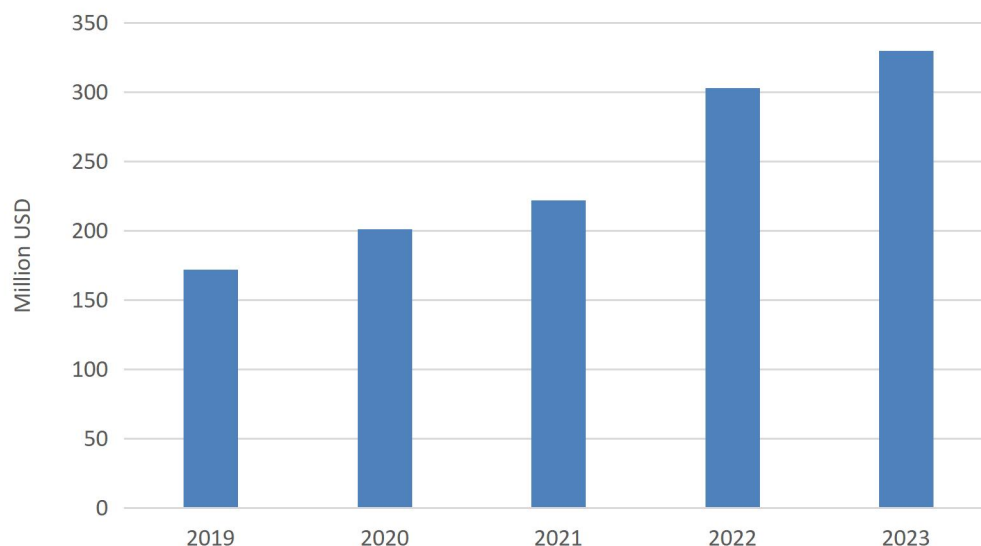
Source: ITC

In 2023, Japan ranked 5th among countries importing coffee from Vietnam with coffee export turnover reaching 260 million USD, accounting for 8.29% of Vietnam's coffee exports (OEC, 2023). The main type of coffee exported to this market is Robusta coffee with an average growth rate of 12.6% per year in the period 2019-2023 (Ministry of Industry and Trade, 2024).

Besides, in New Zealand, within the first half of 2023, Vietnam surpassed Colombia to become the second largest coffee supplier, accounting for 14.2% of the imported coffee market share in this country. In Australia, the average annual growth rate of Vietnam's exports to the Australian market in the period 2019 - 2023 is recorded at 6.5%, in 2023 the export turnover in 2023 reached 43 million USD, nearly double the export turnover in the first year of applying CPTPP (Ministry of Industry and Trade, 2024). In addition, other markets such as Mexico and Canada are also potential places for Vietnamese coffee exports, providing opportunities to expand and diversify the market.

3. Research methodology

3.1. Research model

The purpose of this study is to investigate the impact of CPTPP participation on the export value of Vietnamese coffee products. Regarding the model that would be applied, the gravity model has been chosen due to its successful empirical model for analyzing and explaining the international trade flows. This model is based on Newton's law of universal gravitation, which

had been published in 1687 and then first applied by Tinberger in 1962 who used this model to explain bilateral trade flows between European countries. He found out the relationship between trade flows and GNP of the exporting country to determine the quantity of goods produced and the GNP of the importing country. In its basic form, the gravity model is written as follow:

$$\ln \text{Exp}_{ij} = \beta_0 + \beta_1 \ln \text{GDP}_i + \beta_2 \ln \text{GDP}_j + \beta_3 \ln \text{Dis}_{ij} + \varepsilon_{ij} \qquad (1)$$

According to Helpman, Krugman (1987) and Frankel (1997) the trade flow between two countries is not only affected by the above-mentioned factors but also by many other factors. Linnemman (1963) expanded the model by adding population variables to account for economies of scale:

$$\ln \text{Exp}_{ij} = \beta_0 + \beta_1 \ln \text{GDP}_i + \beta_2 \ln \text{GDP}_j + \beta_3 \ln \text{Dis}_{ij} + \sum \beta_k \ln A_{ij} + \varepsilon_{ij} \qquad (2)$$

In this study, the author uses balanced panel data which is a combination of time series of spatial observations. Panel data provides data with more information, more diversity, less collinearity between variables, larger degrees of freedom and more efficiency. Through studying repeated spatial observations, panel data is more suitable for studying the dynamics of change. Panel data can better detect and measure the effects that cannot be observed in pure time series or cross-sectional (spatial) data.

Additionally, in order to avoid misspecification of functional form and not including important variables in the model, the research added other economic variables which have effect on the export value of coffee product, as well (Ha *et al.*, 2023). Export value (VALex) is a key indicator that measures the total worth of goods and services a country sells internationally. The main independent variable is CPTPP which is a dummy variable due to the time it came into effect. The set of control variables including exporting quantity (QUAex), population variable (POP), the annual growth rate of GDP of Vietnam (GDPvn) and CPTPP member countries (GDPfor), the distance between two countries (DIST).

The author proposes the following research model:

$$\ln \text{VALex}_{ijt} = \beta_0 + \beta_1 \text{CPTPP}_{ij} + \beta_2 \ln \text{QUAex}_{ijt} + \beta_3 \ln \text{GDP}_{it} + \beta_4 \ln \text{GDP}_{jt} + \beta_5 \text{POP}_{ijt} + \beta_6 \ln \text{DIST}_{ij} + \lambda_{ij} +$$
$$(3)$$

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On the other hand, the log-linear regression model for the gravity model is not recommended because that using the OLS method to estimate model (3) will lead to serious problems such as the estimated coefficients will be biased due to the presence of heteroscedasticity in the log-lin function (Silva and Tenreyro, 2006). Santos and Tenreyo proposed to use the Poisson pseudo maximum likelihood (PPML) model to deal with trade value equal to zero.

Therefore, the model applied in this research will be written as follow:

$$VALex_{ijt} = e^{\beta_0 + \beta_1 CPTPP_{ij} + \beta_2 \ln QUAex_{ijt} + \beta_3 \ln GDP_{it} + \beta_4 \ln GDP_{jt} + \beta_5 POP_{ijt} + \beta_6 \ln DIST_{ij} + \lambda_{ij} + \mu_t + \varepsilon_{ij}}$$

(4)

In which:

$VALex_{ijt}$: coffee export value of country i (Vietnam) to country j in year t.

GDP_{it}, GDP_{jt} gross domestic product of country i (Vietnam) and country j in year t.

POP_{ijt}: population of country i and population of country j in year t.

$DIST_{ij}$: geographical distance from country i to country j.

$QUAex_{ijt}$: coffee export quantity of country i and coffee export quantity of country j in year t

$CPTPP_{ij}$: dummy variable

λ_{ij}: fixed effect variable

μ_t: time-effect variable

ε_{ij}: error term

3.2. Data source

The data source used as our research sample is panel data from 9 country members of CPTPP agreement (see Appendix A) during 11 years from 2013-2023. This time period is long enough to study the long-term trend as well as finding the difference in coffee export value between before and after taking part in the CPTPP of Vietnam. Brunei and the United Kingdom are excluded from the selected countries due to its late coming into force of CPTPP. Source of the data set is presented in Table 1.

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Variable name	Description	Measurement	Data source	Variable source
Dependent Variables				
VALex	Exporting coffee value	Thousand US Dollar	Trade Map	(Nguyễn Đức Thảo)
Independent Variables				
CPTPP	CPTPP came into effect	Dummy variable: = 1 if the time is agreement takes effect; = 0 otherwise		
QUAex	Exporting coffee quantity	Tons	Trade Map	Yue Gao, John Whalley, and Yonglei Ren (2013) Shi Bingzhan (2010)
POP	Population	Thousand People	World Development Indicators	Abidin, Haseeb, and Islam (2016)
DIST	Geographic distance	Kilometers	Distance calculator	Tiziano and Diego (2014)
GDPfor	Gross domestic product of CPTPP country	Annual %	World Bank OECD	Squartini and Garlaschelli (2014)

	members				
GDPvn	Gross domestic product of Vietnam	Annual %		World Bank OECD	Yusurf et al (2018)

Table 2: Summary of variables and data sources

Source: Author's compilation

3.3. Statistical description

Table 3 presents the findings of the summary measurements among variables.

Variables	Observations	Mean	Std. Dev.	Min	Max
VALex	99	36215.87	56391.8	0	255712
CPTPP	99	0.3636364	0.4834938	0	1
ln_QUAex	89	8.569186	1.776152	5.361292	11.56134
ln_POP	99	17.11268	1.082917	15.30664	18.68104
ln_DIST	99	8.81983	0.9088114	7.379751	9.865396
ln_GDPfor	99	1.733283	0.3731623	0.9375545	2.094763
ln_GDP	99	0.9507262	0.710834	-1.519686	2.591908

Table 3: Summary statistics of variables

Source: Author's calculation

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The average coffee export value is approximately 36215.87 thousand USD, with a notably high standard deviation of 56391.8, indicating substantial variability. The smallest export value is recorded for Brunei at 0 thousand USD, while the highest is for Japan, reaching 255712 thousand USD. The CPTPP dummy variable shows that 36.36% of trade relationships fall under CPTPP enforcement, with some member countries considered to have joined starting in 2019, aligning with Vietnam's implementation of the agreement. The logarithm of export quantity, population, and geographic distance have average values of 8.57, 17.1 and 8.82, respectively, with moderate variability. Meanwhile, Vietnam's GDP remains relatively stable, with an average of 1.73.

	VALex	CPTPP	ln_QUAex	ln_POP	ln_DIST	ln_GDPfor	ln_GDPvn
VALex	1.0000						
CPTPP	0.0482	1.0000					
ln_QUAex	0.7626	-0.0993	1.0000				
ln_POP	0.6965	-0.0159	0.8132	1.0000			
ln_DIST	-0.2093	-0.0454	-0.1236	0.1728	1.0000		
ln_GDPfor	-0.3179	-0.0027	-0.2254	-0.2678	-0.2788	1.0000	
ln_GDPvn	-0.0000	-0.3174	0.0453	-0.0278	-0.0008	-0.2022	1.0000

Table 4: Correlation description

Source: Author's calculation

Table 3 presents the correlation matrix among all the variables. All the correlation coefficients are smaller than 0.8, which shows that the multicollinearity error will not happen as suggested by Gujarati and Porter (2009). With the exception of geographic distance, all other variables exhibit a positive relationship with coffee export value with export quantity showing

the highest coefficient value, followed by population, suggesting larger markets and higher volumes drive trade. CPTPP enforcement and Vietnam's GDP show weak associations. In contrast, distance negatively correlates with export value, highlighting geographical trade barriers.

4. Analysis and discussion

4.1. Controlling for Multilateral Resistance Terms (MRTs)

According to the "Gravity with Gravitas: A Solution to the Border Puzzle (Anderson & van Wincoop, 2003), MRTs capture the extent to which a country is affected by trade barriers from all other trading partners, rather than just a specific bilateral partner. If a model does not properly account for MRTs, the estimated coefficients may suffer from omitted variable bias, leading to unreliable results.

To verify whether our model has controlled for MRTs, we compare two specifications:

- Model 1: Without Fixed Effects (MRTs not controlled)
- Model 2: With Fixed Effects at the country-pair-year level (exp_imp_id year) to account for MRTs

Model	CPTPP	ln_QUAex	ln_POP	ln_DIST	ln_GDPvn	ln_GDPfor
Without Fixed Effects	0.480 (0.000)	0.686 (0.000)	0.386 (0.000)	-0.042 (0.071)	0.435 (0.000)	-0.225 (0.000)
With Fixed Effects	0.0408 (0.002)	0.954 (0.000)	0.146 (0.208)	omitted	0.002 (0.687)	omitted

Table 5: MRTs' results

Source: Author's calculation

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In the model without Fixed Effects, the coefficient of Distance is statistically significant, indicating that geographical distance has a significant impact on bilateral trade. When adding Fixed Effects (exp_imp_id year), Distance is omitted, proving that Fixed Effects have absorbed the impact of MRTs, ensuring that the model properly controls them.

An important observation is that CPTPP remains statistically significant in both models, regardless of whether Fixed Effects are included. This indicates that the effect of CPTPP on coffee exports is not driven by omitted variable bias from MRTs. This result confirms that our Gravity Model successfully accounts for MRTs through Fixed Effects, preventing bias due to omitted variables.

4.2. Testing model defects

Given that PPML automatically addresses heteroskedasticity, this study focuses on diagnosing potential multicollinearity and autocorrelation issues to ensure the robustness of the model. After running the PPML regression analysis, we test the model to check for multicollinearity by applying the Variance Inflation Factor (VIF). The VIF test helps identify potential collinearity issues among independent variables. The results are presented below.

Variable	VIF	1/VIF
CPTPP	1.16	0.863869
ln_QUAex	3.99	0.250698
ln_POP	3.93	0.254323
ln_DIST	1.45	0.689152
Ln_GDPfor	1.24	0.806608
ln_GDPvn	1.16	0.863869
Mean VIF	2.16	

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Table 6: Multicollinearity check on Stata

Source: Author's calculation

The results indicate no evidence of multicollinearity among the variables, as VIF is 2.16, well below 5. So, multicollinearity is not a concern in the model, ensuring the reliability of the estimated coefficients.

Next, the Wooldridge test was used to test out whether the model had autocorrelation. The result showed a P-value of 0.1872, which is higher than the significance level of 5%. This means that this model do not have autocorrlation.

Our model do not have any defects. The results of the Poisson Pseudo Maximum Likelihood (PPML) are shown in the following table.

Independent variables	PPML
CPTPP	0.480
	(0.000)
ln_QUAex	0.686
	(0.000)
ln_POP	0.386
	(0.000)
ln_DIST	-0.225
	(0.029)
ln_GDPfor	-0.042
	(0.071)
ln_GDPvn	0.435
	(0.000)
Constant	-1.867

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	(0.002)
Observation	79
R-squared	0.9700

Table 7: PPML estimation results

Source: Author's calculation

4.3. Discussion

All the variables have been tested at the 5% significance level. According to the PPML estimator, CPTPP had a statistically significant effect on the export value of Vietnamese coffee, with a positive coefficient of 0.480. Thus, holding other factors constant, when an additional country becomes a member of the CPTPP, Vietnam's coffee export value is expected to increase by approximately 61.6%. This result highlights the positive trade-boosting impact of the agreement between Vietnam and CPTPP member countries.

Exporting coffee quantity had a statistically significant effect on the export value of coffee with a positive coefficient of 0.686. It means that when coffee export quantity increases by 1%, Vietnam's export value to CPTPP countries increases by 0.686%. The population of the CPTPP partners had a statistically significant effect on the export value of coffee with a positive coefficient of 0.386. It means that when population size increases by 1%, Vietnam's export value to CPTPP countries increases by 0.386%.

Apparently, it can be seen that the GDP of the countries in CPTPP did not have a significant impact on coffee exports. Meanwhile, the domestic GDP had a statistically significant effect on the export value of coffee with a positive coefficient of 0.435. It means that when population size increases by 1%, Vietnam's export value to CPTPP countries increases by 0.435%. Geographic Distance has a statistically significant effect on the export value of coffee with a positive coefficient of - 0,225. Hence, when coffee export quantity increases by 1%, Vietnam's export value to CPTPP countries decreases by 0,225%.

5. Challenges, opportunities and recommendations

5.1. Challenges

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The CPTPP, while offering significant trade opportunities, also presents challenges to Vietnam's coffee industry. CPTPP imposes strict rules of origin and high product standards, requiring policy adjustments to support exporters meeting compliance requirements as well as greater investment in transportation, storage, and processing facilities to meet international demands. Vietnam coffee export enterprises encounter severe competition from other CPTPP members, which also benefit from tariff reductions. Compliance with certifications and quality standards increases operational costs, requiring businesses to enhance supply chain efficiency and production capabilities.

Another major challenge for Vietnamese farmers under the CPTPP is stricter sustainability and product origin requirements, creating challenges in procuring raw materials and improving traceability. Farmers must adopt better farming practices and invest in certifications to maintain access to CPTPP markets, which can be costly and complex.

In addition, fierce competition from major coffee suppliers such as Colombia, Brazil, and Indonesia is also a big challenge for Vietnam. These countries all have their own advantages in terms of quality, product brands, and distribution networks, requiring Vietnam to innovate technology and quality management as well as be more creative in marketing and brand promotion to maintain its position.

Logistics and infrastructure factors also have a strong impact on coffee exports. Although there have been many improvements, warehouse infrastructure and the transportation system are still limited, causing transportation costs to remain high, especially in the context of rising fuel prices, affecting selling prices, reducing competitiveness, and making it difficult to expand markets in countries with long geographical distances such as Mexico and Peru.

5.2. Opportunities

The CPTPP is a significant trade agreement that brings numerous benefits to Vietnam's coffee industry. For the government, CPTPP strengthens Vietnam's trade relations with countries like Canada, Mexico, and Peru, which previously had no direct free trade agreements with Vietnam. Many coffee products with high tax are reduced to 0% - 5% as soon as CPTPP takes effect or after the agreement has gone into force for a certain period of time, usually 3-7 years. Peru and Chile commit to remove 100% of tariff for coffee export right after CPTPP is effective.

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CPTPP also promotes collaboration among member countries, further encouraging foreign investment and solidifying Vietnam's market position.

As demand continues to escalate, tariff reductions allow businesses to expand into previously untapped markets, boost export volumes, enhance supply chains and distribution networks, and expand the consumer base with access to high-quality coffee. CPTPP's commitments to rules, transparency, and anti-corruption, especially in the export process and business environment, enhance Vietnam's trade climate and lower enterprise cost, thus positively impacting coffee export industries.

At a societal level, CPTPP encourages investment in infrastructure and promotes job creation in coffee-producing regions. For coffee farmers, market expansion means higher demand and income opportunities. Increased investment in sustainable farming and quality certification programs helps farmers improve production efficiency and meet the growing demand for high-quality coffee in CPTPP markets.

5.3. Recommendatio

5.3.1. Policy implications

To foster identified opportunities and overcome the challenges, some specific solutions would be proposed. Being aware of strict requirements for rule of origin and quality standards for export productions of the CPTPP, the government should first implement policies to support farmers in their process of coffee manufacturing to enhance the rate of having certification compliance such as Fair Trade, Rainforest Alliance and UTZ certification, thus farmers successfully have a chance of being imported.

Moreover, provinces with large coffee areas can consider their ecological conditions to develop a suitable coffee production plan, research and development initiatives should be acquired to find out the prevailing coffee segments for each coffee region. Besides, the policy implications need to promote suitable development in farming practices and encourage organic coffee manufacturing to meet the demand of domestic and global customers along with quality standards of each import country.

In addition to farmer support, the government should invest in cutting-edge technologiessuch as traceability systems to improve infrastructure in coffee-producing regions

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and optimize logistic programs. Another shortcoming lies in the transport, storage and processing should be coped with by enhancing the last-mile delivery to reduce the cost and collaborate with private sectors to create a coffee manufacturing zone, hence improve port facilities and cold storage systems to meet the international standards.

The state also needs to promote export by providing export financing for small and medium coffee enterprises (SMEs) such as low-interest loans, loan guarantees, product price support. Along with financial assistance, a clear legal corridor is needed to attract resources from all economic sectors and non-governmental organizations interested in investing in coffee production (Luong and Tauer, 2006). Additionally, the state should acquire international strategies like trade promotion and market diversification to ensure proper market place for coffee businesses. Not only actively negotiate programs in order to support Vietnam enterprises in engaging in trade fairs and business-matching events but the government also strengthens the diplomatic trade relation with CPTPP members to secure long-term market access.

5.3.2. Recommendation for Domestic Enterprise

In terms of supply chains, Vietnamese enterprises ought to decrease market price of the products by directly connecting to household farmers with a view to eliminate the cost of intermediaries, ensure the origin and can also invest in sustainable farming if necessary. In logistics, they can flexibly adopt free-drying and wet processing technologies to preserve coffee bean quality in long-distance delivery.

Vietnamese coffee enterprises also applied a market diversification strategy to evaluate the benefits from a wide range of tariff rate and preferential tariff treatment of the CPTPP agreement and customize marketing strategies tailored to consumer preferences in each international market. Secondly, they should leverage technology and e-commerce. In this digital transformation era, businesses can make use of agriculture 4.0 to not only improve coffee quality and productivity but also take part in e-commerce to expand into the global market through e-commerce platforms such as Alibaba, Tradekey or Globalsources.

Professional branding and value addition should be should combine with a variety of manufacturing methods such as shifting from raw coffee exports to processed products like roasted, ground, instant, and capsule coffee to gain higher profits margins and supply to high-end markets. Vietnamese coffee brands need to increase their competitiveness in producing high-

value coffee products such as instant coffee and ready-to-drink coffee beverages instead of relying solely on raw coffee.

6. Conclusion

The findings show that CPTPP has a positive impact on Vietnam's coffee export value by reducing trade barriers, eliminating tariffs, and fostering greater market access within CPTPP member countries. Other determinants such as export quantity, population size, and Vietnam's GDP have also played significant roles in shaping export performance, while geographic distance remains a limiting factor.

Apart from that, Vietnamese coffee exporters have to struggle with strict quality standards, comply with non-tariff barriers, and become more competitive in a very dynamic market. The study highlights the need for strategic policy reforms, investments in quality improvement, and practice of sustainable approaches in order to maximize the benefits from the CPTPP. This research contributes valuable input for policymakers and businesses aiming to optimize their export strategies by outlining the CPTPP's role within Vietnam's coffee export industry. In sum, maximizing the efforts of Vietnam's participation in the CPTPP will ultimately have a significant influence on the longer-term development of Vietnam and its competitiveness in the global coffee market.

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Appendices

Appendix A: List of countries studied

No.	Country Name	No.	Country Name	No.	Country Name
1	Australia	4	Japan	7	New Zealand
2	Canada	5	Malaysia	8	Peru
3	Chile	6	Mexico	9	Singapore

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