

Study on the Impact of RCEP National Logistics Performance on Vietnam's Cross-Border E-Commerce Export Trade

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Abstract: In the era of global economic integration, the Regional Comprehensive Economic Partnership (RCEP) plays a pivotal role in shaping trade dynamics, particularly by enhancing Vietnam's cross-border e-commerce exports through improved logistics. This study meticulously reviews a vast array of both domestic and international literature and employs Stata 17.0 software to analyze panel data spanning from 2014 to 2022 across RCEP member countries. It focuses on six core logistics performance indicators: customs and logistics management, logistics infrastructure, timeliness of shipments, quality of logistics services, tracking and tracing capabilities, and ease of international shipments. The findings from this analysis reveal that these logistics performance indicators significantly influence Vietnam's e-commerce exports. Infrastructure quality and the ease of shipments have the most substantial impact, suggesting that robust logistics infrastructure and efficient shipment processes are crucial for enhancing trade efficiency. Despite the overall positive trends, the study notes significant variations in logistics development within the RCEP region. While countries like Singapore exhibit advanced logistics capabilities, ASEAN countries generally lag behind, indicating a disparate level of logistics progress across the region. The research highlights the potential for targeted logistics improvements to directly boost Vietnam's cross-border e-commerce exports. By advancing logistics performance, especially in areas lagging behind, there is an opportunity to not only enhance trade but also to level the playing field within the RCEP. This study underscores the critical importance of developing cohesive and efficient logistics systems to support the burgeoning e-commerce sector, thereby fostering economic growth and deeper regional integration within the RCEP framework.

Keywords: Logistics Performance Index; Vietnam's cross-border e-commerce; RCEP; Export trade.

1. Introduction

In the era of globalization, the Regional Comprehensive Economic Partnership (RCEP) significantly influences Vietnam's economic integration. Established in 2020, RCEP encompasses 15 Asia-Pacific nations, creating the largest free trade area globally. This agreement enhances Vietnam's cross-border e-commerce exports by improving logistics, reducing tariffs, and opening growth opportunities in sectors like telecommunications and agriculture. RCEP's member countries, often experiencing higher growth rates than the US and Europe, offer vast markets that boost Vietnamese trade and attract foreign investment, reinforcing RCEP's role as a new engine for international trade growth.

The implementation of RCEP has been pivotal in developing a favorable market environment for Vietnam's cross-border e-commerce, boosting logistics, and fostering the sector's growth. As global economies rebound from COVID-19, RCEP's role in expanding market access, promoting exports, connecting with regional value chains, and attracting investment has been critical. Furthermore, reductions in tariffs have opened new opportunities in key industries.

Vietnam's 13th National Party Congress has advocated for the advancement of the digital economy and industries, with a focus on high-tech sectors and the development of cross-border e-commerce. The "Vietnam Business Environment Reform Action Plan 2021-2025" outlines ongoing efforts to enhance trade facilitation and logistics reforms, broaden logistics networks, and improve freight efficiency. These initiatives aim to strengthen regional cooperation and

improve Vietnam's international trade standing.

As cross-border e-commerce grows, the importance of efficient international logistics comes to the forefront, though high logistics costs remain a challenge due to a mix of policy, legal, infrastructural, and cultural factors. Disparities in natural resources, technology, and education among RCEP countries also present obstacles to economic uniformity in the region. According to the 2023 World Bank LPI, Vietnam ranks fourth in Southeast Asia, indicating ongoing challenges in the logistics sector. Identifying effective strategies to enhance logistics and support cross-border e-commerce remains crucial for Vietnam's continued growth in this area.

2. Theoretical Background

2.1. Research on Logistics Performance:

In 1987, Rhea and Shrock[1] first introduced the concept of logistics utility, defining it as the integration of "human effort" and "non-labor or materialized labor" in goods movement, and developed an index to measure it. Expanding on this, Christopher (2008)[2] argued from a business perspective that logistics efficiency should reflect not only the overall efficiency of a company's logistics activities but also the efficiency within specific operational segments. This includes analyzing the balance between labor costs, labor use, and the value logistics adds in meeting specific customer demands. Despite these developments, the definition of logistics efficiency continues to be debated, with some scholars focusing on quantitative measures like time and cost, and others advocating for a broader approach that includes sustainability and environmental concerns. Internationally,

the Logistics Performance Index (LPI), developed by the World Bank and the Turku School of Economics, is recognized as a reliable tool for evaluating national logistics performance. This study adopts the LPI, which will be further elaborated in the subsequent section.

2.2. Research on Cross-Border E-commerce:

The study by Đặng, T. H., & Nguyễn, B. H. T. (2020)[3] examines the development, challenges, and opportunities of cross-border e-commerce in Vietnam, addressing aspects like market size, stakeholders, and the policy environment. It discusses specific challenges such as competition, payment security, logistics, and intellectual property. The paper notes that cross-border e-commerce development is influenced by multiple factors. Gesner G.H. (2015) [4] indicated that improving consumer satisfaction with logistics services can significantly increase customer loyalty, which is one of the main drivers of cross-border e-commerce development.

2.3. Research on the Correlation between Logistics Performance and Cross-Border E-commerce:

Hertel and Mirza (2009) [5] were the first to incorporate

the Logistics Performance Index (LPI) into an extended trade gravity model, applying it to the study of international trade in agricultural and industrial products. Liang Ye and Cui Jie (2019) [6] included a trade potential variable in their empirical analysis framework to study the impact of logistics performance on international trade along the "Belt and Road" countries. They found that improvements in the LPI significantly enhanced China's trade potential.

3. Research Hypothesis and Model

3.1. The Logistics Performance Index

The Logistics Performance Index (LPI), introduced by the World Bank in its 2007 "Connecting to Compete" report, has become a key benchmark for evaluating logistics improvements globally. This index, which is published biennially, has been released in the years 2007, 2010, 2012, 2014, 2016, 2018, and most recently in 2023. It assesses countries based on a five-point rating system across six dimensions of logistics performance, utilizing surveys and analyses conducted with international freight forwarders and express carriers. The LPI provides a comprehensive overview of a country's logistics capabilities, with higher scores indicating stronger performance.

Indicator	Definition	Weight
Customs and Border Management	The efficiency of customs and other border management agencies in executing clearance procedures: This includes evaluating the speed and efficiency of customs procedures for processing imports and exports, considering the customs process, related time and costs, and the transparency of the process.	0.4105
Infrastructure	The quality of logistics infrastructure related to trade and transportation, such as roads, railways, ports, and warehouses: This involves consideration of the modernization level, maintenance status, and the capacity of the infrastructure to meet economic demands.	0.4133
Timeliness	The ability to deliver goods to recipients within the expected timeframe: This evaluates the punctuality and accuracy of deliveries, including the frequency and accuracy of on-time delivery, as well as flexibility and responsiveness to unforeseen changes and events.	0.4021
Logistics Services Quality	The quality and competitiveness of services provided by logistics companies, such as freight forwarding, transshipment, and customs services: This assesses the quality of transportation and other logistics services, including the professionalism, skills, and reliability of the service providers.	0.4168
Tracking and Tracing	The ability to track and trace goods during transportation: This measures the capability to monitor and manage information about the location and status of goods, considering the technologies and information systems used for tracking and managing cargo information.	0.4133
International Shipments	The ease of arranging competitively priced transportations: This measures the convenience of finding and arranging competitively priced transportations, including the ability to access price information, negotiate prices, and the flexibility of service providers.	0.3931

Extensive data from over a thousand industry organizations contribute to this index, making it a vital tool for countries to understand their logistics strengths and weaknesses and aiding in policy development. The LPI covers nearly 200 countries and is considered a crucial benchmark for evaluating national logistics capacities.

3.2. The Origin of the Gravity Model

The gravity model is a fundamental theoretical framework in transportation studies, primarily used to quantify the attraction between two entities based on mass and distance. Economists have adapted this model to analyze international trade, illustrating that trade volume between two countries

tends to be directly proportional to their combined GDP and inversely proportional to their geographical separation. Early applications by economists such as Beckman in 1956, and Ding Bogen and Poyhonen in the early 1960s, demonstrated the model's effectiveness in correlating trade flows with economic power and geographic proximity. These findings have made the gravity model a popular tool for analyzing international trade dynamics, with its basic formulation captured in simple mathematical expressions like Equation.

$$M_{ij} = \beta_0 \frac{y_i^{\beta_1} y_j^{\beta_2}}{DIS_{ij}^{\beta_3}}$$

In the aforementioned formula, the letter 'i' represents the

exporting country, and 'j' represents the importing country. M_{ij} denotes the export trade volume from country i to country j , while y_i and y_j represent the economic sizes of countries i and j respectively, typically measured by their respective Gross Domestic Product (GDP). $DIST_{ij}$ signifies the geographical distance between the two countries, which is usually measured by the distance between their capitals or major ports. $\beta_0, \beta_1, \beta_2$, and β_3 are the constant terms in the model.

3.3. Research Model

The Logistics Performance Index (LPI) can be subdivided into several categories: Customs and Border Management, Infrastructure, Timeliness of Freight Transportation, Quality of Logistics Services, Customer Cargo Tracking and Inquiry Capabilities, and Frequency of Cargo Delivery. The LPI includes these six detailed sub-indicators to more comprehensively describe a country's logistics performance within a specified time frame. To more accurately study how logistics performance influences cross-border e-commerce export trade, this paper proposes an extended method using the trade gravity model. In the model-building process described in this section, in addition to the conventional variables of total economic output and geographical distance, new variables are introduced based on practical circumstances, including the Logistics Operation Index, population size, the development level of mobile internet, and geographical dummy variables. The specific equations used are as follows in the formula provided:

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln LPI_{it} + \mu_i \quad (3.2)$$

In the formula mentioned above, EXP_{it} represents the cross-border e-commerce export trade value of Vietnam to country i in year t ; GDP_{it} denotes the Gross Domestic Product of member country i in year t ; $VNGDP_t$ signifies the Gross Domestic Product of Vietnam in year t ; $DIST_{it}$ indicates the geographical distance between Vietnam and member country i ; POP_{it} reflects the population size of country i in year t ; INT_{it} represents the level of internet development in country i in year t ; BOR_i is a dummy variable indicating whether member country i shares a common border with Vietnam, assigned a value of 1 if there is a common border, and 0 otherwise; β_0 is a constant term; β_k (where $k=1,2,\dots$) are the regression coefficients for the explanatory variables, and μ_i is the random error term.

The Logistics Performance Index (LPI) of RCEP member countries and its six sub-indicators are central variables established in this paper to address the core research question. Building upon the analyses discussed earlier, it can be inferred that the logistics performance and its six sub-indicators are significant factors influencing Vietnam's cross-border e-commerce export volumes, as demonstrated in equations (3.3), (3.4), (3.5), (3.6), (3.7), and (3.8).

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln CUS_{it} + \mu_i \quad (3.3)$$

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln INF_{it} + \mu_i \quad (3.4)$$

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln SHIP_{it} + \mu_i \quad (3.5)$$

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln SER_{it} + \mu_i \quad (3.6)$$

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln TRA_{it} + \mu_i \quad (3.7)$$

$$\ln EXP_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln VNGDP_t + \beta_3 \ln DIST_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INT_{it} + \beta_6 BOR_i + \beta_7 \ln TIM_{it} + \mu_i \quad (3.8)$$

4. Research Methodology

This study employs a multifaceted research methodology, incorporating literature review, qualitative and quantitative analysis, and comparative analysis. Detailed overviews of each method used are provided below:

(1) Literature Review and Synthesis Approach

This research began with a comprehensive collection of domestic and international literature related to the RCEP agreement, cross-border e-commerce, and logistics performance through libraries and online databases. The existing research findings were summarized and synthesized. Through this process, the paper provides a thorough review and explanation of the relevant concepts and theoretical foundations, offering robust theoretical support for the study.

(2) Qualitative and Quantitative Analysis Methods

The research initially utilized qualitative methods to assess the level of logistics development in RCEP member countries and the current state of Vietnam's cross-border e-commerce export trade to these nations. Subsequently, quantitative methods were integrated by constructing appropriate econometric models to analyze how logistics performance influences cross-border e-commerce export trade. This included the calculation of correlation coefficients and impact effects.

(3) Comparative Analysis Method

Using the Logistics Performance Index published by the World Bank as a tool, this method involves comparing the differences in logistics development levels among RCEP member countries. Additionally, by examining the trends and disparities in Vietnam's cross-border e-commerce export trade to RCEP member countries, the research analyzes the causes of these differences.

5. Empirical Analysis

5.1. Selection of Data Types and Models

In econometric modeling, the primary data types include time-series, cross-sectional, and panel data. Time-series and cross-sectional data often lack comprehensive information and fail to capture dynamic changes, affecting model validity. To overcome this, this study uses panel data to minimize the impact of omitted variables and unpredictable individual differences.

Since this study utilizes short-panel data (where nn is greater than or equal to TT and spans 2014-2022), unit root and cointegration tests are unnecessary. Panels where NN far exceeds tt generally have limited temporal data, reducing

concerns over autocorrelation. Thus, the study skips these tests and directly moves to panel model selection and testing.

Panel data regression typically involves three models: the Fixed Effects Model (FEM), Random Effects Model (REM), and Mixed Effects Model. FEM adjusts for varying intercepts across data points but keeps slope coefficients consistent, while REM accounts for unobserved individual or time effects and considers coefficients as random variables. Mixed

Effects combines both fixed and random effects to handle complex data.

Using Stata 17.0 software, this study confirmed significant individual effects, indicated by " $\rho = 0.89031937$." An F-test verified the presence of individual effects ($F(11,90) = 48.14$, $\text{Prob} > F = 0.0000$), supporting the selection of FEM over Mixed Effects. The subsequent LM test was used to decide between Mixed and Random Effects Models.

Table 5-1. Results of the LM Test

	Var	Sd=sqrt(Var)
LnEXP	1.073776	1.036232
e	0.0086124	0.0928032
u	0.0699103	0.2644056

Test: Var(u)=0
chibar2(01) = 371.10
Prob>chibar2 = 0.0000

5.2. Overall Regression Analysis Results

Table 5-2. Overall Regression Analysis Results for Vietnam's E-commerce Exports

Variable	Coefficient	Standard Error	t-value	P> t
ln_GDP	0.890***	0.148	6.02	0.000
ln_VNGDP	1.782***	0.296	6.01	0.000
ln_DIST	-0.891***	0.092	-9.66	0.000
ln_POP	-0.462**	0.161	-2.87	0.005
ln_INT	0.389*	0.158	2.47	0.015
ln_LPI	-2.077*	1.017	-2.04	0.044
BOR	0.143	0.154	0.93	0.356
cons	-12.45***	3.311	-3.76	0.000

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

According to Table 5-2, The regression analysis shows that the GDP of partner countries (ln_GDP) and Vietnam (ln_VNGDP) significantly boost Vietnam's cross-border e-commerce exports, indicating a positive correlation between economic growth and export capacity. Conversely, geographical distance (ln_DIST) has a strong negative impact, reducing exports by 0.891% for every 1% increase in distance. Population size (ln_POP) also shows a modest negative effect, while internet development (ln_INT) positively impacts export growth, emphasizing the importance of digital infrastructure. Logistics performance (ln_LPI) has an unexpected negative relationship, indicating that improved logistics doesn't always translate into higher exports. Lastly, the presence of a common border (BOR) shows no significant impact on cross-border e-commerce exports.

5.3. Analysis of Sub-Index Regression Results

This section analyzes six logistics sub-indicators instead of a single index to understand the impact on Vietnam's cross-border e-commerce exports. The regression analysis results reveal that:

The analysis of six logistics sub-indicators instead of a single index helps reveal their impact on Vietnam's cross-border e-commerce exports. The results indicate that GDP (ln_GDP) and Vietnam's Per Capita GDP (ln_VNGDP) both significantly boost e-commerce exports, underscoring the importance of economic growth. Meanwhile, geographical distance (ln_DIST) has a strong negative impact due to heightened logistical challenges and transportation costs. Population size (ln_POP) has a mild-to-moderate negative

effect, while internet penetration (ln_INT) positively influences export levels. Among the sub-indicators, transportation (ln_SHIP) stands out for its significant negative influence, highlighting the crucial role of logistics and transportation systems. While infrastructure (ln_INF) also negatively impacts exports, its influence is less pronounced. Customs (ln_CUS), services (ln_SER), trade (ln_TRA), and time (ln_TIM) show no significant effect, suggesting they aren't the primary obstacles to Vietnam's e-commerce exports. Investing in transportation and infrastructure remains critical, while other factors need further strategic evaluation.

5.4. Stability Test

This section verifies the reliability and validity of the previous empirical analysis by conducting stability testing. Stability tests determine whether model results are sensitive to specific assumptions or data changes by replacing variables, adjusting sample ranges, or using alternative estimation methods. Following the regression analyses in sections 5.2 and 5.3, the BOR variable was excluded due to its low statistical significance, limited contribution, and potential multicollinearity issues. This exclusion allows the model to focus on more influential variables like economic scale, per capita GDP, distance, population size, internet access, and the Logistics Performance Index, which directly impact Vietnam's e-commerce exports.

Re-running the stability test without the BOR variable confirmed that the main conclusions remain consistent, reinforcing the significance and stability of factors like economic scale and per capita GDP. Excluding the BOR

variable simplified the model and increased explanatory power, as evidenced in Tables 5-4 and 5-5.

Table 5-3. Regression Analysis Results for Sub-Indices of Vietnam's E-commerce Exports

Variable	(3.3)	(3.4)	(3.5)	(3.6)	(3.7)	(3.8)
ln_GDP	0.835*** (0.157)	0.966*** (0.168)	0.876*** (0.099)	0.894*** (0.157)	0.658*** (0.120)	0.704*** (0.108)
ln_VNGDP	1.776*** (0.301)	1.921*** (0.295)	1.574*** (0.291)	1.918*** (0.297)	1.856*** (0.302)	1.731*** (0.323)
ln_DIST	-0.869*** (0.093)	-0.893*** (0.091)	-0.996*** (0.094)	-0.881*** (0.091)	-0.812*** (0.087)	-0.817*** (0.084)
ln_POP	-0.413* (0.165)	-0.467** (0.157)	-0.404** (0.127)	-0.437** (0.157)	-0.282 (0.157)	-0.354* (0.163)
ln_INT	0.356* (0.159)	0.334* (0.157)	0.385* (0.150)	0.357* (0.158)	0.373* (0.163)	0.412* (0.167)
BOR	0.210 (0.148)	0.184 (0.146)	0.021 (0.151)	0.159 (0.152)	0.253 (0.152)	0.220 (0.152)
ln_CUS	-1.312 (0.887)					
ln_INF		-1.753* (0.787)				
ln_SHIP			-2.726*** (0.734)			
ln_SER				-1.861 (0.969)		
ln_TRA					-0.223 (0.801)	
ln_TIM						-0.934 (0.972)
_cons	-13.401***	-13.562***	-10.090***	-13.806***	-16.824***	-14.654***
N	108	108	108	108	108	108

Note: *** indicates a significance level of 1%, ** indicates a significance level of 5%, and * indicates a significance level of 10%. The values in parentheses represent the t-values.

Table 5-4. Comparison of Two Different Regression Results

Overall Regression Analysis Results		Stability Test Regression Analysis Results	
Variable	Coefficient	Variable	Coefficient
ln_GDP	0.890***	ln_GDP	0.932***
ln_VNGDP	1.782***	ln_VNGDP	1.808***
ln_DIST	-0.891***	ln_DIST	-0.928***
ln_POP	-0.462**	ln_POP	-0.457**
ln_INT	0.389*	ln_INT	0.359*
ln_LPI	-2.077*	ln_LPI	-2.449*

Table 5-4 compares the regression results with and without the BOR variable to evaluate model stability. Key factors like economic scale (ln_GDP), per capita GDP (ln_VNGDP), distance (ln_DIST), population size (ln_POP), internet access (ln_INT), and the Logistics Performance Index (ln_LPI) consistently influence Vietnam's e-commerce exports, regardless of whether RCEP countries share borders with Vietnam. The positive effect of economic scale increased slightly from 0.890 to 0.932, while per capita GDP rose from 1.782 to 1.808, both significant at the 1% level. The negative impact of distance also strengthened from -0.891 to -0.928. Population size had a slight inhibitory effect, while internet access positively influenced e-commerce. The negative effect of the Logistics Performance Index increased from -2.077 to -2.449, emphasizing the need for efficient logistics. This stability testing validates the research model's robustness, confirming that these factors remain significant even without considering the BOR variable, providing a strong basis for future policy and strategic planning.

Table 5-5. Comparison of Two Regression Results Under Sub-Indices

Sub-Index Regression Analysis Results		Stability Test Regression Analysis Results	
Variable	Coefficient	Variable	Coefficient
ln_CUS	-1.312	ln_CUS	-1.636
ln_INF	-1.753*	ln_INF	-2.006**
ln_SHIP	-2.726***	ln_SHIP	-2.771***
ln_SER	-1.861	ln_SER	-2.233*
ln_TRA	-0.223	ln_TRA	-0.648
ln_TIM	-0.934	ln_TIM	-1.384

Table 5-5 further confirms the model's stability by comparing the two regression results. Notably, after excluding the BOR variable, the negative impacts of customs (ln_CUS), infrastructure (ln_INF), transportation (ln_SHIP), and services (ln_SER) increased. These changes emphasize

the importance of improving infrastructure, optimizing the trade environment, and enhancing service quality to boost Vietnam's e-commerce exports.

In summary, through an in-depth analysis of Tables 5-4 and 5-5, and stability tests, this study reveals the key factors influencing Vietnam's e-commerce exports and underscores the need to consider economic development, market size, technical infrastructure, and logistics efficiency when formulating e-commerce export promotion strategies. Such strategies will not only help overcome logistical and geographical challenges but will also leverage economic growth and technological advancement to further enhance Vietnam's e-commerce export growth.

6. Conclusions and Recommendations

6.1. Conclusion

This paper evaluates the logistics performance of RCEP member countries from 2007 to 2023 and the status of Vietnam's cross-border e-commerce exports. It provides a comparative analysis of logistics performance, highlighting significant disparities in areas such as infrastructure, customs efficiency, transportation timeliness, and service quality. These disparities impact Vietnam's e-commerce exports to these countries. The study also analyzes Vietnam's e-commerce exports to RCEP nations from 2014 to 2022, including ASEAN, East Asian, and Oceanian countries. By exploring correlations between trade and logistics performance, it offers insights into Vietnam's trade dynamics within the RCEP, aiding in the formulation of future trade strategies and regional cooperation.

Additionally, through empirical testing, the study explores the impact of logistics performance on Vietnam's cross-border e-commerce export trade, highlighting the critical importance of optimizing logistics performance to enhance Vietnam's e-commerce export capabilities. The analysis reveals the positive promotional effect of a larger economic scale on e-commerce exports, and Vietnam's GDP per capita also shows a significant positive effect. The negative impact of distance on exports points to the challenges posed by logistical distances, while the effects of population size and internet penetration emphasize the importance of digital connectivity.

Notably, in the analysis of the impact of specific sub-indicators, the international transport convenience scores of RCEP countries stand out with their significant negative impact at the highest 1% significance level, underlining the importance of improving transportation and logistics systems to boost e-commerce exports.

Overall, the findings of this study emphasize the central role of logistics performance in promoting Vietnam's cross-border e-commerce exports and indicate that optimizing logistics systems and improving logistics efficiency are crucial for enhancing Vietnam's competitiveness in the global market. This research not only provides empirical support and concrete suggestions for policymakers and practitioners in Vietnam's e-commerce export sector but also lays a

foundation for future academic research and policy formulation.

6.2. Recommendations

To enhance logistics performance and boost Vietnam's competitiveness in the global e-commerce market, this paper offers several strategic recommendations:

1. Infrastructure Development: Vietnam should focus on long-term infrastructure plans, prioritizing key logistics nodes and employing PPP models to enhance efficiency and attract international investment..

2. Customs Optimization: Streamlining customs procedures through electronic and paperless systems will speed up cross-border transactions and reduce costs.

3. Logistics Service Quality: Encouraging the adoption of modern logistics technologies and establishing a logistics service quality evaluation system will improve the overall service standards.

4. Regional Cooperation: Active participation in regional logistics projects and cooperation in standardizing logistics procedures will address cross-border logistics challenges and reduce costs.

5. E-commerce Platform Utilization: Supporting local e-commerce platforms with incentives and attracting international e-commerce players will expand Vietnam's market reach and enhance its global e-commerce presence.

6. Legal and Policy Framework Strengthening: Developing a robust legal and policy framework will secure e-commerce transactions and support the growth of the e-commerce sector, enhancing consumer protection and cybersecurity.

These strategies aim to streamline logistics and customs processes, enhance service quality, and foster regional and global integration, positioning Vietnam as a competitive player in international e-commerce.

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