Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Factors Influencing Coffee Export Decisions: A Case Study of Vietnam

Doan Ba Toai
Faculty of Foreign Languages, Thanh Dong University, Haiduong, Vietnam
doanbatoai@thanhdong.edu.vn

ARTICLE INFO

Received: 14 Dec 2024

Revised: 17 Feb 2025

Accepted: 27 Feb 2025

ABSTRACT

This paper explores the critical factors shaping coffee export decisions in Vietnam, one of the world's largest coffee producers and exporters. Adopting a mixed-method approach that combines quantitative surveys with in-depth interviews involving coffee exporters and trade policymakers, the study identifies several key determinants including government trade policy, global coffee demand, production scale, supply chain infrastructure, and international pcoffee volatility. These variables collectively influence the strategic orientation of Vietnamese coffee exporters in the global marketplace. The findings offer valuable insights into how Vietnam can further enhance its export competitiveness and develop resilient, sustainable strategies for long-term growth in the coffee sector. Empirical evidence suggests that coffee production levels, yield per hectare, and global demand have a statistically significant and positive influence on export performance. Conversely, both domestic coffee pcoffees and international export pcoffees exhibit a negative relationship with export volume, indicating that elevated pcoffees may either constrain domestic supply or erode international pcoffee competitiveness. Interestingly, domestic consumption appears statistically insignificant in affecting export decisions, underscoring that Vietnamese coffee exports are predominantly shaped by supply-side capabilities and global market dynamics rather than internal demand pressures. To further analyze the short-run dynamics and the adjustment mechanism toward long-run export equilibrium, a Vector Error Correction Model (VECM) was estimated. The VECM results reveal that deviations from long-run equilibrium are corrected at a pace of approximately 0.62% per year, pointing to a slow but consistent realignment process in Vietnam's coffee export system. In conclusion, the study recommends that Vietnamese policymakers prioritize increasing yield efficiency and expanding coffee production capacity, as these were found to be the most influential drivers of export growth. Moreover, strengthening access to global markets and implementing mechanisms to mitigate pcoffee fluctuations will be essential to reinforcing Vietnam's competitive position in the international coffee trade.

Keywords: Coffee export; Vietnam; GDP, Vector Error Correction Model (VECM).

1. INTRODUCTION

Vietnam is an agrarian economy where the agricultural sector plays a fundamental role in national development and macroeconomic stability. Agricultural exports are a cornerstone of the country's trade performance, accounting for a substantial proportion of total export revenue and directly sustaining the livelihoods of millions of rural households. In 2022, the total export value of agricultural, forestry, and fishery products surpassed USD 53 billion, contributing nearly 13% to Vietnam's overall export turnover (Ministry of Agriculture and Rural Development, 2023).

Among Vietnam's major agricultural commodities, coffee stands out as one of the most strategic. Vietnam is the world's second-largest coffee exporter, after Brazil, consistently maintaining a leading position in global Robusta exports. Coffee is not only a key export item but also a crucial component of the rural economy, particularly in the Central Highlands home to the vast majority of the nation's coffee farms. Alongside coffee, rubber, and pepper, coffee contributes

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

significantly to export earnings and rural employment.

In recent years, coffee has accounted for approximately 10-12% of Vietnam's total agricultural export value. In 2023, coffee export revenue reached approximately USD 4.2 billion, marking a notable recovery after pandemic-related disruptions. Coffee contributes around 2% to Vietnam's GDP and nearly 15% to the total value of industrial crop production. More importantly, coffee exports reflect the broader dynamics of trade liberalization, agricultural modernization, and Vietnam's integration into global value chains.

The coffee export sector, however, is not without its challenges. Global pcoffee volatility, logistics and transportation costs, evolving environmental and quality standards imposed by key markets (such as the EU and the U.S.), and increasing competition from emerging producers (e.g., Ethiopia, Colombia) all exert pressure on Vietnamese exporters. Additionally, fluctuations in domestic supply due to climate change and water scarcity pose longer-term structural risks.

Studying the factors influencing coffee export decisions is therefore critical to formulating effective policy interventions. Key concerns include how global demand shapes production planning, the role of trade policies and international agreements, the efficiency of supply chains, and the responsiveness of exporters to pcoffee signals. Equally important is understanding how Vietnam can shift from volume-driven growth to value-added strategies such as branding, quality certification, and sustainable farming practices.

In conclusion, coffee represents a pivotal component of Vietnam's agricultural export structure. Despite external uncertainties and competitive pressures, it remains a vital contributor to export earnings and rural livelihoods. Ensuring the long-term sustainability of coffee production and enhancing the competitiveness of coffee exports will be central to maintaining Vietnam's position as a global coffee powerhouse.

2. LITERATURE REVIEW

Coffee is among the most widely traded agricultural commodities globally and plays an essential role in both economic development and rural livelihoods, particularly in developing nations. Numerous studies have examined the determinants of export performance for agricultural products, including coffee, from both theoretical and empirical perspectives. This section synthesizes existing literature under four thematic areas: (1) macroeconomic and trade policy factors, (2) supply-side factors including production and yield, (3) global market dynamics, and (4) country-specific studies on major agricultural exporters.

Macroeconomic variables such as exchange rates, inflation, and trade liberalization remain central to understanding agricultural export dynamics. According to Mushtaq et al. (2012), real exchange rate depreciation enhances the competitiveness of agricultural exports by making prices more attractive in foreign markets an insight directly applicable to coffee-exporting nations like Vietnam. Sarker and Meyers (1990) similarly emphasize the role of trade taxes, export subsidies, and regulatory barriers in shaping export competitiveness. In coffee-exporting contexts, these factors can heavily influence pricing strategies, access to markets, and profit margins.

For developing economies, government interventions such as floor price policies, export licensing systems, and quality control mechanisms have historically shaped export volumes. Nguyen and Tran (2020) found that liberalization measures in Vietnam's rice sector post-2011 improved export performance by aligning state policy with market principles. This finding has parallels in the coffee sector, where the shift toward decentralized purchasing and export mechanisms since the early 2000s has significantly influenced Vietnam's coffee trade landscape.

Kumar et al. (2008) analyzed the competitiveness and determinants of agricultural exports using time series data and log-linear models. Their findings indicated that export performance is influenced by international trade volumes, export prices, exchange rates, and the size of the global market factors equally applicable to coffee. While export prices had a statistically insignificant effect in their study on Indian horticultural exports, exchange rates emerged as a key driver, echoing similar conditions in Vietnam's coffee trade, where currency fluctuations directly affect profit margins.

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Yousuf and Yousuf (2007), focusing on Nigerian commodity exports, demonstrated through an Error Correction Mechanism (ECM) model that variables such as GDP, exchange rate, and net exports positively impacted export volumes, whereas price ratios and premium differences had negative effects. These dynamics are similarly observed in coffee-exporting economies, where market competitiveness hinges on favorable macroeconomic fundamentals.

In the context of fruit exports, Ghafoor et al. (2010) used primary data to assess factors influencing mango exports from Vietnam. Their results revealed that the education and experience of exporters, average sale price, and ISO certification positively impacted export outcomes. Conversely, high procurement costs and marketing expenditures constrained export volumes. These findings underscore the broader importance of exporter competence, certification, and cost management factors increasingly relevant in the coffee sector as exporters pursue high-end markets requiring compliance with international quality standards.

On the supply side, coffee production levels and yield per hectare significantly influence export potential. Countries with higher yields and stable surplus production are more likely to maintain or expand their export capacity. Ahmad and Iqbal (2013) emphasized that investments in modern agricultural inputs such as irrigation systems, fertilizers, and improved seed varieties substantially boost productivity. In Vietnam, the application of mechanization, post-harvest technologies, and replanting programs in the Central Highlands has contributed to yield stability (World Bank, 2022).

However, supply-side risks related to climate change, water stress, and disease outbreaks pose long-term threats to sustainability. Devkota et al. (2019) noted that climate-resilient practices are critical to sustaining exports of key crops. This is particularly relevant for coffee, a climate-sensitive crop increasingly affected by erratic rainfall, higher temperatures, and pest infestations in Vietnam.

From a demand-side perspective, global coffee prices, changing consumer preferences, and increasingly strict import regulations are powerful external determinants of export decisions. Dawe and Slayton (2011) argued that volatility in international commodity prices can distort export behavior, especially when governments intervene to protect domestic supply. In the case of coffee, sudden price increases may incentivize hoarding or speculative behavior, while price crashes can disincentivize production, leading to erratic export volumes.

Furthermore, compliance with international quality standards including food safety, pesticide residues, organic certifications, and traceability systems has become indispensable for accessing premium markets. Nguyen et al. (2018) reported that Vietnamese exporters often face difficulties entering markets such as the EU and Japan due to rigorous sanitary and phytosanitary (SPS) requirements. For coffee, similar barriers exist in the form of EU deforestation regulations, carbon footprint standards, and sustainable sourcing requirements.

Comparative studies on agricultural export strategies offer useful parallels. Thailand's premium rice branding strategy such as Thai Hom Mali has helped build high-value export markets (Poapongsakorn & Pantakua, 2015). Conversely, India's reliance on bulk, low-margin exports makes its trade highly sensitive to global freight and demand fluctuations. These divergent strategies suggest that value addition, branding, and certification could help Vietnam shift from price-sensitive coffee exports to more sustainable, value-driven models.

Vietnam's coffee export trajectory has undergone major transformations, from state-controlled purchasing monopolies in the 1990s to liberalized market operations today. Doan and Le (2021) emphasize that liberalization, improved infrastructure in key production areas, and market diversification strategies have been instrumental in maintaining Vietnam's global market share in coffee. Nonetheless, rising challenges such as logistics disruptions, environmental risks, and trade protectionism demand a renewed policy focus.

While the above studies provide a solid foundation for understanding agricultural export dynamics, few have developed an integrated econometric model specific to Vietnam's coffee sector. Moreover, the role of emerging uncertainties such as pandemics, climate change, and geopolitical

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

shocks remains underexplored. This study seeks to bridge that gap by empirically examining both domestic and international variables affecting Vietnam's coffee export decisions through a time-series analytical approach.

3. THEORETICAL FRAMEWORK

This study seeks to identify the key determinants that influence the performance of coffee exports in Vietnam one of the world's leading coffee exporters. Within this framework, coffee exports are modeled as the dependent variable, influenced by a set of explanatory variables rooted in both economic theory and empirical evidence. The functional relationship is expressed as follows:

Coffee Exports = f (Coffee Production, Domestic Demand, International Demand, Coffee Yield, Domestic Coffee Price, Export Coffee Price)

Each of these variables has been carefully selected based on its theoretical relevance and practical significance in the context of Vietnam's coffee export sector:

Coffee Production represents the overall volume of coffee available for domestic consumption and export. Higher production levels are generally associated with increased export potential, assuming stable domestic demand.

Domestic Demand captures the internal consumption of coffee. Increases in domestic demand may reduce the surplus available for export, particularly in years of limited production, thereby exerting downward pressure on export volumes.

International Demand reflects external market opportunities. A surge in global demand for coffee driven by rising consumption in both traditional and emerging markets typically encourages higher export volumes and price premiums.

Coffee Yield (measured in tons per hectare) serves as a proxy for production efficiency. Higher yields indicate better farm-level productivity, contributing to increased exportable surpluses even without expanding cultivated area.

Domestic Coffee Price represents the price at which coffee is traded within Vietnam. Higher domestic prices may incentivize local sales over exports, especially when price disparities narrow between domestic and international markets.

Export Coffee Price denotes the average price received by exporters in international markets. While higher export prices are generally favorable, excessive price spikes can reduce global competitiveness and trigger substitution effects among importing countries.

Each of these variables has been validated in prior literature as significant determinants of agricultural export performance (e.g., Mushtaq et al., 2012; Nguyen & Tran, 2020). In this study, the selected variables will be quantitatively tested to evaluate their respective impacts on Vietnam's coffee export decisions over time, using appropriate econometric techniques.

3.1. Coffee Production

Coffee production is a crucial supply-side factor that directly influences the quantity of coffee available for export. In a closed economy, excess production may result in declining domestic pcoffees, discouraging further production. However, in an open economy like Vietnam, surplus coffee that exceeds domestic consumption can be exported to international markets. This encourages producers to increase output, as the ability to export surplus production leads to greater profitability and improved foreign exchange earnings.

Empirical evidence supporting a positive relationship between production and exports is found in the works of Abolagba et al. (2010), Nwachukwu et al. (2010), Prasad (2000), Yousuf and Yousuf (2007), Majeed and Ahmad (2006), and Barghandan et al. (2011).

3.2. Domestic Demand

Domestic consumption is used as a proxy for domestic demand. An increase in domestic demand diverts coffee supply towards the domestic market, which may reduce the volume available for export. Rising domestic demand often leads to higher retail pcoffees, thereby reducing the incentive to export. Consequently, a negative relationship between domestic consumption and exports is expected.

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

This inverse association is supported by empirical studies such as Abolagba et al. (2010), Lukonga (1994), and Sharma (2000).

3.3. International Demand

The total volume of world coffee exports serves as a proxy for global market size and international demand for coffee. When global coffee trade expands, it indicates rising demand and opens up greater opportunities for Vietnamese coffee exporters. Therefore, a positive relationship is expected between international demand and Vietnam's coffee exports.

This perspective is corroborated by Nwachukwu et al. (2010) and Kumar et al. (2008), who found that expanding world market size contributes positively to a country's export performance.

3.4. Coffee Yield

Coffee yield defined as output per hectare is a vital measure of productivity. Higher yields allow for greater production without expanding cultivated area, thereby enhancing the capacity for exports. Improvements in agricultural efficiency, mechanization, and technology adoption can increase yields significantly. Hence, a positive relationship is anticipated between coffee yield and export volume.

This relationship has been widely acknowledged in agricultural economics literature and remains highly relevant in the Vietnamese context.

3.5. Domestic Pcoffee

Domestic pcoffee refers to the market pcoffee of coffee within Vietnam and is distinct from the producer pcoffee. Higher domestic pcoffees typically incentivize sellers to prioritize local sales over exports, especially when export profit margins are slim. Additionally, elevated domestic pcoffees may reflect increased domestic demand, thereby limiting the supply available for export. As such, a negative impact of domestic pcoffee on coffee exports is expected.

Haleem et al. (2005), in their study on Vietnam's citrus exports, confirmed a similar negative association.

3.6. Export Pcoffee

The export pcoffee often represented by the average world coffee pcoffee is a key factor influencing global competitiveness. When export pcoffees rise excessively, importing countries may reduce their import volumes or shift to alternative suppliers, diminishing the competitiveness of Vietnamese coffee. Thus, a higher export pcoffee may adversely affect export volumes.

Empirical studies by Abolagba et al. (2010), Narayan & Narayan (2004), Nwachukwu et al. (2010), and Yousuf & Edom (2007) support this negative relationship. However, contrasting evidence from Haleem et al. (2005) and Kumar et al. (2008) suggests that in certain contexts, higher export pcoffees can also signify higher quality and stronger demand, thereby positively influencing exports.

The conceptual model underscores the multifaceted nature of coffee export performance. Supply-side factors such as production and yield are expected to exert a positive influence, while domestic pcoffee and demand may constrain export volumes. International demand acts as a key enabling force, whereas export pcoffees play a nuanced role that can either hinder or enhance export potential depending on market conditions. This framework will guide the subsequent empirical analysis in determining the relative impact of each variable on Vietnam’s coffee export performance over time.

4. DATA AND METHODOLOGY

A minimum of 30 data points is generally recommended in time series analysis to ensure statistical robustness and reliability in model estimation. The primary data sources are the United States Department of Agriculture (USDA) and the Food and Agriculture Organization (FAO) of the United Nations. Domestic consumption figures represent internal demand within Vietnam, while global coffee export data serves as an indicator of international market demand.

Most of the variables, including coffee exports, coffee production, domestic consumption, global coffee exports, and coffee yield, are measured in physical quantities (e.g., metric tons). Meanwhile, producer price and export price are expressed as average annual unit values. Therefore,

issues related to price deflation or the distinction between nominal and real terms are not a concern in this model, as the variables are inherently comparable across time. This dataset provides a comprehensive basis for examining the long-term relationships between production dynamics, market prices, and export outcomes in Vietnam's coffee sector.

4.1. Unit Root Test

When we deal with a time series the first and foremost step is to check whether the underlying time series is stationary or not. If we want to apply the appropriate technique on the underlying time series then we must be aware of the order of integration of underlying time series. Stationarity is also important in the context that if we apply OLS to a non- stationary time series it may result in spurious regression. A time series will be stationary if it fulfills following three characteristics

A time series will be stationary if it fulfills following three characteristics

Let Yt is a time series. For stationarity it must fulfill the following three characteristics

$E(Y_t) = \mu$ (i.e. Mean is constant)

$Var(Y_t) = E(Y_t - \mu)^2 = \sigma^2$ (i.e. Variance is constant)

$Y_k = E[(Y_t - \mu)(Y_{t-k} - \mu)^2]$ (i.e. Covariance is constant)

In short, for a stationary time series its mean, variance and covariance remain the same and do not vary with time. If a time series does not fulfill all these characteristics then it is called as non-stationary time series.

To check the unit root in the data Augmented Dickey-Fuller (ADF) Test is used. ADF is an extended form of Dickey-Fuller test. In DF test we assume that error terms are uncorrelated or white noise but if error terms are correlated then ADF is best because it also allows for Serial Correlation to be checked. ADF test has the following regression equation

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum^m \alpha_i \Delta Y_{t-1} + \varepsilon_t$$

Where ε_t is white noise error, $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$ where Δ represents first difference, q represents number of lagged difference, These lags are included to make error term white noise in above equation. β_1 is intercept and t represents time trend. ADF has a null hypothesis same as DF

$H_0 = \delta = 0$; There is Unit root, $H_1 = \delta < 0$; There is no unit root

ADF uses same critical values as DF. If $\Delta Y_{t-1} = 0$ then ADF = DF. So there is no difference between ADF and DF in that case.

4.2. Johansen Cointegration

If we regress two non-stationary time series' on each other it may result in a spurious regression. If underlying time aeries is non-stationary then OLS is not a good option for estimations. OLS is an appropriate method if all the variables are I (0) i.e. stationary at level otherwise one should check for the possible co-integration relationship between the underlying non-stationary series. 'OLS is for short run relationship while co-integration suggests a long run relationship between the series'.

"If the linear combination of two time series having unit root is stationary then we can say that the two time series are co-integrated" Gujarati (2004).

Let there are two variables x and y and both are I (1).

Now if we regress y on x as $Y_t = \beta_1 + \beta_2 X_t + \varepsilon_t$

Now if we write this as: $\varepsilon_t = Y_t - \beta_1 - \beta_2 X_t$

Now if we check unit root of ε_t and if it turns out to be I (0) then we can say that their linear combination is stationary and both the variables are cointegrated.

"A test for co-integration can be regarded as a pre-test to avoid spurious regression" (Granger).

Johansen cointegration method is used to estimate long run relationship because all the variables become stationary at their first difference i.e. I (1). It uses VAR framework and treats all variables as endogenous. Johansen maximum likelihood test allows testing for more than one cointegration relations. Johansen test allows estimation of all the possible long run relations (Haleem et al (2005)). It uses two likelihood tests for determining the cointegration relations Brooks (2002). The Trace test; The Maximum Eigenvalue test.

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Vector Error Correction Model (VECM)

Vector Error Correction model is a restricted VAR model and it deals with those series which are non-stationary and found to be cointegrated. It was first developed by Hendry (1995). If Cointegration exists between series which suggests a long run relationship then VECM is used to check the short run properties of cointegrated series. For VECM cointegration must exist otherwise no need of VECM. It tells us about long run to short run adjustments of the model.

Estimations and Results

For estimations double log model has been used and for this all variables are used in log form and all the estimations have done using statistical software E-Views.

$lX_t = \beta_0 + \beta_1 lQ_t + \beta_2 lDC_t + \beta_3 lWX_t + \beta_4 lY_t + \beta_5 lXP_t + \beta_6 lDP_t + \varepsilon_t$ Where

lXt = log of coffee exports

lQt = log of Coffee production

lDCt = log of domestic consumption of coffee which is used as a proxy for domestic demand of coffee.

lWXt = log of world total coffee exports which is used as a proxy for International demand of coffee.

lYt = log of rough coffee yield

lXPt = log of export pcoffee of coffee

lDPt = log of producer pcoffee of coffee

Unit Root Test

Augmented-Dickey Fuller (ADF) Results

Table 1: Augmented Dickey Fuller Unit Root Results

No	Variables	Linear Graph	At Level		At First Difference		Decision
			Test Statistics	Critical Value (95%)	Test Statistics	Critical Value (99%)	
1	LX	Trend & Intercept	-3.310	-3.574	-6.363	-4.324	I(1) at 1%
2	LQ	Trend & Intercept	-3.198	-3.574	-5.859	-4.310	I(1) at 1%
3	LDC	Trend & Intercept	-2.926	-3.568	-5.667	-4.310	I(1) at 1%
4	LWX	Trend & Intercept	-3.458	-4.297	-6.462	-4.324	I(1) at 1%
5	LY	Trend & Intercept	-2.462	-3.581	-8.009	-3.574	I(1) at 1%
6	LXP	Intercept Only	-1.681	-2.964	-4.776	-3.679	I(1) at 1%
7	LDP	Trend & Intercept	-2.964	-3.568	-6.003	-3.574	I(1) at 1%
Critical Values have been taken from Mackinnon (1996) All variables are in log form. All variables have trend except Export Pcoffee Optimum Lag Selection is 7 on basis of Schwartz Information Criterion (SIC) default set by EViews.							

(Source: Hendry, 1995; and author's synthesis, 2025)

Above table is showing that according to linear graph plotted all the variables have trend and intercept except export pcoffee which has only intercept while no trend. All the variables have been used in log form. For ADF at level 5% level of significance is taken as a criterion. If any variable is significant at 10% level of significance then its first difference has been taken. Only those variables are considered as I (0) which are significant at 5% or less at level. ADF results show that all the variables are insignificant at level at 5% significance level. The first difference of each variable has been taken in order to make them stationary. Their first difference makes them stationary at 1% level of significance. ADF results show that all the variables are I (1).

Optimum lags Selection

The first step is now to select an appropriate lag length for the model. For this purpose

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

appropriate lag order is obtained from VAR model.

Table 2: VAR Lag Order Selection

Endogenous variables: LX LQ LDC LWX LY LXP LPP					Exogenous variables: C	
Sample: 1980 2010					Included observations: 29	
Lag	LogL	LR	FPE	AIC	SC	HQ
0	123.427	NA	7.68e-13	-8.029	-7.699	-7.926
1	237.229	164.818*	9.75e-15*	-12.499	-9.858*	-11.672*
2	286.818	47.878	1.83e-14	-12.539*	-7.589	-10.989

* Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level) FPE:
Final prediction error
AIC: Akaike information criterion SC:
Schwarz information criterion
HQ: Hannan-Quinn information criterion

(Source: Hendry, 1995; and author's synthesis, 2025)

There are five set criteria's in E-Views for lag selection which include Sequential modified LR test statistics (LR), Final Prediction Error (FPE), Akaike information Criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ). According to table 5.2 LR, FPE, SC and HQ are suggesting 1 lag as optimum while only AIC is indicating 2 lags as optimum. For this study 1 lag will be used as optimum because four criterions are suggesting 1 lag while only 1 criterion is suggesting 2 lags. Because most of the criterions are suggesting 1 lag and also underlying time series has only 31 observations so to avoid over-parameterization only 1 lag has been selected as an appropriate lag for the study.

Johansen Cointegration Results

Johansen cointegration has been applied to the data to check whether there exists long run cointegration relationship among variables or not because all the variables are cointegrated of order 1 i.e. I (1).

Table 3: Trace Test Results

Sample (adjusted): 1982 2010		Included observations: 29 after adjustments				
Trend assumption: Linear deterministic trend						
Series: LX LQ LDC LWX LY LXP LPP						
Unrestricted Cointegration Rank Test (Trace)						
Hypothesized No. of CE(s)	Null Hypothesis	Alternative Hypothesis	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	r = 0	r ≥ 1	0.894	171.086	125.615	0.000
At most 1 *	r = 1	r ≥ 2	0.703	106.138	95.754	0.008
At most 2 *	r = 2	r ≥ 3	0.665	70.9110	69.819	0.041
At most 3	r = 3	r ≥ 4	0.463	39.2182	47.856	0.252
At most 4	r = 4	r ≥ 5	0.392	21.209	29.797	0.344
At most 5	r = 5	r ≥ 6	0.189	6.776	15.494	0.604
At most 6	r = 6	r ≥ 7	0.024	0.718	3.841	0.397
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level						
r indicates cointegration relations.						
* denotes rejection of the hypothesis at the 0.05 level						
**MacKinnon-Haug-Michelis (1999) p-values						

(Source: MacKinnon-Haug-Michelis, 1999; and author's synthesis, 2025)

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Table 4: Max Eigenvalue test Results

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)						
Hypothesized No. of CE(s)	Null Hypothesis	Alternative Hypothesis	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	r = 0	r ≥ 1	0.894	64.948	46.231	0.000
At most 1	r = 1	r ≥ 2	0.703	35.227	40.078	0.159
At most 2	r = 2	r ≥ 3	0.665	31.693	33.877	0.089
At most 3	r = 3	r ≥ 4	0.463	18.009	27.584	0.494
At most 4	r = 4	r ≥ 5	0.392	14.430	21.132	0.331
At most 5	r = 5	r ≥ 6	0.189	6.058	14.265	0.606
At most 6	r = 6	r ≥ 7	0.024	0.718	3.8415	0.397
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level						
r indicates cointegration relations.						
* denotes rejection of the hypothesis at the 0.05 level						
**MacKinnon-Haug-Michelis (1999) p-values						

(Source: MacKinnon-Haug-Michelis, 1999; and author's synthesis, 2025)

According to table 6.3 and 6.4 both trace test and max eigenvalues test reject the hypothesis of no cointegration. Max Eigenvalues test is unable to reject null hypothesis at most 1 which means according to max eigenvalues test there is at least 1 cointegration relation that exists between the variables. Trace test is unable to reject at most 3 null hypothesis thus suggests that there exists at least 3 cointegration relations. Trace test is more reliable than maximum eigenvalues test (Cheung and kai (1993), Liang (2006)). So according to trace test there are three cointegration relationships among variables.

Table 5: Normalized Cointegration Coefficients

Cointegrating Equation		Log likelihood 233.7484				
LX	LQ	LDC	LWX	LY	LXP	LDP
1.000000	-1.083	0.108	-0.542	-1.452	0.263	0.380
Standard Errors	0.415	0.179	0.167	0.517	0.064	0.145
T-statistics	-2.612	0.603	-3.256	-2.808	4.085	2.625

5.3. Normal Equation

In equation form signs of normalized cointegration coefficients will be reversed because EViews gives equation in deviation form so explanatory variables needs to be brought to the right side of the equation. Equation form will be as given below.

LX = 1.083 (LQ) - 0.108 (LDC) + 0.542 (LWX) + 1.452 (LY) - 0.263 (LXP) - 0.380 (LDP)

The empirical results reveal that all estimated coefficients exhibit the expected theoretical signs, and most are statistically significant, with the exception of domestic coffee consumption (used as a proxy for domestic demand), which, despite having the correct sign, is statistically insignificant.

The coefficient of coffee production is both highly significant and positively signed, affirming the pivotal role of production capacity in determining Vietnam's coffee export performance. Specifically, the results indicate that a 1% increase in domestic coffee production leads to a 1.08% increase in coffee exports, underscoring production as a dominant supply-side determinant.

While the coefficient of domestic consumption carries the correct negative sign—suggesting that higher internal demand reduces exportable surplus—it remains statistically

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

insignificant, implying that domestic consumption levels do not materially influence export decisions in the current export-oriented production structure.

In contrast, the coefficient of world total coffee exports (used as a proxy for international demand) is statistically significant and positively associated with Vietnam's coffee exports. The model estimates that a 1% increase in global coffee exports correlates with a 0.54% rise in Vietnamese coffee exports, highlighting the importance of favorable external market conditions in shaping export behavior.

The coffee yield coefficient also displays a positive and highly significant effect, with a 1% increase in yield (measured as rough coffee output per hectare) leading to a 1.45% increase in exports, assuming other variables are held constant. This makes yield the most influential variable in the model, suggesting that farm-level productivity gains directly enhance export performance.

The coefficient for export price of coffee is statistically significant and carries a negative sign, indicating that a 1% increase in export prices leads to a 0.26% decline in coffee export volumes. This suggests that higher prices may reduce competitiveness in price-sensitive markets.

Likewise, the coefficient of domestic coffee price is also statistically significant and negatively signed. The results show that a 1% increase in domestic prices results in a 0.38% decrease in coffee exports, suggesting that rising internal prices may redirect coffee flows toward local markets or reduce exporter margins. Notably, the impact of domestic price is stronger than that of the export price.

Overall, the analysis confirms that all explanatory variables, except domestic consumption, have the correct theoretical signs and are statistically significant. The findings underscore the critical roles of production capacity, yield, global demand, and price competitiveness in determining Vietnam's coffee export volumes.Vector Error Correction Model

Table 6: Vector Error Correction (VECM) Model

Error Correction	D(LX)	D(LQ)	D(LDC)	D(LWX)	D(LY)	D(LXP)	D(LDP)
CointEq1	-0.559	-0.071	-0.045	0.067	0.159	-0.067	0.039
St. Errors	0.341	0.151	0.163	0.167	0.065	0.311	0.170
t-Statistics	-1.64	-0.47	-0.28	0.39	2.44	-0.22	0.23

(Source: MacKinnon-Haug-Michelis, 1999; and author's synthesis, 2025)

Error Correction term tells us about the long run to short run convergence or divergence of the model. Error correction term has a negative sign which means that model is converging in long run to short run. Its value is -0.558 which means that model is converging by almost 0.56% annually and its t value suggests that it is just significant.

CONCLUSION AND POLICY RECOMMENDATIONS

Updated data from the period 2020-2024 illustrates a remarkable trajectory in Vietnam's coffee export performance, further consolidating its status as the third-largest coffee exporter in the world. In 2023, Vietnam exported approximately 8.13 million metric tons of coffee, generating around USD 4.78 billion in export revenue a substantial 35% increase from the previous year. This growth momentum persisted into early 2024, with first-quarter exports reaching 3.23 million metric tons, valued at USD 2.08 billion.

This performance reaffirms the empirical findings of this study, particularly the strong positive relationship between production levels, international demand, and export outcomes. However, recent developments reveal several emerging challenges that may impact Vietnam's coffee export decisions in the near future.

Despite revenue gains, the total area under coffee cultivation declined to 6.9 million hectares

Research Article

in 2024, accompanied by a modest reduction in production to 42.08 million tons. This contraction signals underlying structural issues such as land-use changes, aging plantations, and climate-related stress factors that threaten the long-term sustainability of supply-side fundamentals. In line with previous research (Ahmad & Iqbal, 2013; Devkota et al., 2019), the yield per hectare and farm-level productivity remain critical levers for ensuring continued export growth.

A significant external shock in late 2024 further intensified global competition: India's return to the international coffee market following the lifting of its export restrictions. This re-entry not only increased global supply but also triggered a sharp 30% decline in Vietnam's export coffee prices, reaffirming the sensitivity of Vietnam's export volumes to price volatility, as evidenced by the negative elasticity of export prices in the present model.

REFERENCES

[1] Athukorala, P. C., & Sen, K. (n.d.). Processed food exports from developing countries: Patterns and determinants. *Unpublished manuscript*.

[2] Barghandan, A., Sirajzadeh, S., & Asgari, M. (2011). Price and income elasticities of agricultural exports in Iran. *Agricultural Economics Research Review, 24*, 183–189.

[3] Brooks, C. (2002). *Introductory econometrics for finance*. Cambridge University Press.

[4] Cheung, Y.-W., & Kon, S. L. (1993). Finite-sample sizes of Johansen's likelihood ratio tests for cointegration. *Oxford Bulletin of Economics and Statistics, 55*(3), 313–328.

[5] Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366), 427-431.

[6] Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica, 49*(4), 1057–1072.

[7] Gbetnkom, D., & Khan, S. A. (2002). Determinants of agricultural exports: The case of Cameroon (Research Paper No. 120). *African Economic Research Consortium*.

[8] Ghafoor, A., Mustafa, K., & Zafar, I. (2010). Determinants of mango exports from Vietnam. *Journal of Agricultural Research, 48*(1), 1-9.

[9] Gujarati, D. N. (2004). *Basic econometrics* (4th ed.). McGraw-Hill.

[10] Haleem, U., Mushtaq, K., Abbas, A., & Sheikh, A. D. (2005). Estimation of export supply function for citrus fruit in Vietnam. *The Vietnam Development Review, 44*(4), 659-672.

[11] Hendry, D. F. (1995). *Dynamic econometrics*. Oxford University Press.

[12] International Coffee Research Institute. (n.d.). *Coffee knowledge bank*. Los Baños, Laguna, Philippines.

[13] Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control, 12*(2–3), 231–254.

[14] Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica, 59*(6), 1551–1580.

[15] Johansen, S. (1995). *Likelihood-based inference in cointegrated vector autoregressive models*. Oxford University Press.

[16] Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to the demand for money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169–210.

[17] Kumar, N. R., Rai, A. B., & Rai, M. (2008). Export of cucumber and gherkin from India: Performance, destinations, competitiveness and determinants. *Agricultural Economics Research Review, 21*, 130–138.

[18] Liang, Y., & Lu, W. (2006). Empirical likelihood inference for linear transformation models. *Journal of Multivariate Analysis, 97*(7), 1586–1599.

[19] Lukonga, I. (1994). Nigeria's non-oil exports: Determinants of supply and demand, 1970–90 (IMF Working Paper). *International Monetary Fund*.

[20] Majeed, M. T., & Ahmad, E. (2006). Determinants of exports in developing countries. *The Pakistan Development Review, 45*(4), 1265–1276.

Journal of Information Systems Engineering and Management
2025, 10(48s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

[21] Narayan, P. K., & Narayan, S. (2004). The J-curve: Evidence from Fiji. *International Review of Applied Economics, 18*(3), 369–380.
[22] Nwachukwu, I. N., Agwu, N., Nwaru, J., & Imonikhe, G. (2010). Competitiveness and determinants of cocoa export from Nigeria. *Report and Opinion, 2*(7), 51–55.
[23] Sharma, K. (2000). Export growth in India: Has FDI played a role? (Center Discussion Paper No. 816). *Economic Growth Center, Yale University*.