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Factors Affecting Rice Export Decisions: A Case Study of Vietnam

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ABSTRACT

This paper investigates the key factors influencing rice export decisions in Vietnam, one of the world's leading rice exporters. Using a mixed-method approach combining quantitative surveys and in-depth interviews with rice exporters and policymakers, the study identifies variables such as government policy, international market demand, production capacity, logistics infrastructure, and global price fluctuations as critical determinants. The findings provide insights into how Vietnam can enhance its export competitiveness and formulate sustainable export strategies. The empirical results indicate that rice production, yield, and global demand have a statistically significant and positive impact on rice exports. In contrast, both domestic prices and export prices are found to negatively affect rice export volumes, implying that higher price levels may reduce competitiveness or domestic availability. Meanwhile, domestic demand appears statistically insignificant, suggesting that export decisions are more closely tied to supply-side and global market dynamics. To assess the short-term dynamics and the adjustment mechanism toward long-run equilibrium, a Vector Error Correction Model (VECM) is estimated. The VECM results reveal that the system corrects deviations from the long-run path at a rate of approximately 0.62% per year, indicating a slow but steady convergence. In conclusion, the study recommends that Vietnamese policymakers prioritize improvements in rice yield per hectare and total production capacity. These are shown to be the most effective drivers of export growth. Additionally, measures to enhance global market access and reduce price volatility will further strengthen Vietnam's position as a leading rice exporter in an increasingly competitive global market.

Keywords: Rice export; Vietnam; GDP.

1. INTRODUCTION

Vietnam is an agrarian economy, and the agricultural sector plays a vital role in the country's overall economy. Agricultural exports hold significant importance in Vietnam's economic structure, contributing substantially to its overall export revenue. In recent years, food exports have constituted a major share of Vietnam's export portfolio. In 2021, agricultural products, including rice, accounted for a notable portion of the total export value.

Among the major agricultural crops in Vietnam, rice, coffee, and seafood are the primary contributors to export earnings. Of these, rice is one of the most crucial commodities for Vietnam's economy, with the country being one of the world's top rice exporters. Rice exports alone represent a significant share of the nation's total exports, with the percentage fluctuating based on global demand, production volumes, and market conditions.

Rice holds a strategic position in Vietnam's export economy. As of the most recent data, rice exports contribute approximately 9% to the country's overall export value, making it one of the top export commodities. Rice is also a key contributor to Vietnam's GDP, with agriculture accounting for about 15% of the national economy, and rice cultivation alone plays a substantial role within this sector. The rice sector not only provides income for millions of Vietnamese farmers but also contributes to the global food market.

Vietnam is an agrarian economy in which the agricultural sector plays a crucial role in ensuring national economic stability and development. Agricultural exports consistently account for a significant proportion of the country's

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total export value, contributing not only to trade balance but also to the livelihoods of millions of rural households. In 2022, the export value of agricultural, forestry, and fishery products exceeded USD 53 billion, representing nearly 13% of the country's total export turnover (Ministry of Agriculture and Rural Development, 2023).

Among Vietnam's key agricultural commodities, rice holds a particularly strategic position. Vietnam consistently ranks among the top three rice-exporting countries in the world, alongside India and Thailand. The four major agricultural crops in Vietnam are rice, coffee, rubber, and pepper. Of these, rice serves both as a staple food domestically and as a major export commodity, accounting for approximately 10–15% of the country's total rice production.

In 2023, Vietnam's rice export revenue reached approximately USD 4.7 billion the highest in over a decade contributing nearly 9% to the total agricultural export value. Rice contributes around 2% to Vietnam's GDP and more than 10% to the total output value of crop production. Notably, rice exports are not merely a trade activity but also reflect the effectiveness of pricing policies, food security strategies, infrastructure investment, and the overall competitiveness of the agricultural sector.

However, Vietnam's rice exports still face numerous challenges, including global price volatility, high logistics costs, increasingly strict quality requirements from premium markets, and intensified regional competition. Therefore, studying the factors affecting rice export decisions is essential for proposing appropriate policies and solutions to enhance the competitiveness of this strategic commodity.

In conclusion, rice is a cornerstone of Vietnam's agricultural export sector. Despite fluctuations in global demand and prices, rice remains one of the most significant contributors to the country's export earnings and GDP. Given this, ensuring the sustainability of rice production and improving export competitiveness will continue to be a focus for policymakers aiming to maintain and expand Vietnam's position in the global rice trade.

2. LITERATURE REVIEW

Rice is one of the most traded agricultural commodities in the world and plays a central role in food security and economic development, particularly in Asia. Numerous studies have examined the determinants of rice export performance from both theoretical and empirical perspectives. This section synthesizes the existing literature under four main themes: (1) macroeconomic and trade policy factors, (2) supply-side factors including production and yield, (3) global market dynamics, and (4) country-specific studies on rice-exporting nations.

Macroeconomic variables such as exchange rates, inflation, and trade liberalization have long been identified as critical determinants of agricultural exports. According to Mushtaq et al. (2012), real exchange rate depreciation tends to enhance the competitiveness of agricultural exports, including rice, by making export prices more attractive in foreign markets. Similarly, Sarker and Meyers (1990) highlight the impact of export taxes, subsidies, and trade restrictions on the international competitiveness of rice-exporting countries.

In the context of developing economies, government intervention through price stabilization policies, export quotas, and buffer stocks has also influenced export volumes. Nguyen and Tran (2020) found that in Vietnam, the relaxation of rice export quotas after 2011 significantly improved export performance by aligning domestic policy with market-based mechanisms.

Kumar, et al (2008), tried to find out empirically the performance, competitiveness and determinants of exports. Time series data was used. Comparative advantage was examined through export performance ratio. Log linear model was used for determinants of exports. Exports depend upon total international trade in specific commodity, export price, exchange rate and world market size. Indian exports of gherkin and cucumber depend positively on their international trade volume, Exchange rate, export prices but export price was insignificant. In findings India was highly competitive in exports of both these commodities and exchange rate was significant determinant than prices.

Yousuf and Yousuf (2007) had tried to explore determinants of three major agricultural commodities of Nigeria including cocoa, rubber and palm kernel. Time series data from 1970-2002 had been used for analysis. Error Correction Mechanism was used. Unit root test was also applied and all series were stationary at first difference.

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Quantity Eexported was used as dependent while price ratio of export to domestic unit value index, net exports value, real GDP, domestic production, exchange rate, premium are independent. In findings GDP, exchange rate and net exports had positive impact on exports while price ratio and premium had negative impact.

Ghafoor, et al (2010) had tried to find out the impact of those factors that affect the export of mango in Vietnam. Primary data was collected through survey of forty mango exporters and modeled it using double log form of regression analysis. Results indicate that education of exporter, experience of exporter, average purchase price, average sale price, average marketing cost, and ISO certificate had a significant impact on exports of mango. Education, experience, average sale price, and ISO certificate had significant positive impact while average purchase price and average marketing cost have significant negative impact on exports of mango.

Rice production levels and yields per hectare are supply-side factors that directly impact export capacity. Countries with higher yields and surplus production are more likely to export. As emphasized by Ahmad and Iqbal (2013), investment in irrigation, fertilizers, and high-yield seed varieties substantially enhances rice productivity and export potential. In Vietnam, significant improvements in post-harvest infrastructure and mechanization have contributed to consistent increases in rice output (World Bank, 2022).

Moreover, yield variability due to climate change, water scarcity, or pest outbreaks has become a growing concern in recent literature. Studies by Devkota et al. (2019) suggest that climate-resilient agricultural practices are critical for ensuring sustainable rice exports.

On the demand side, global rice prices, consumer preferences, and import regulations are powerful external determinants of rice export decisions. Dawe and Slayton (2011) argue that international price volatility can distort the export behavior of rice-exporting nations, especially when domestic food security is at stake. For instance, sudden price hikes often trigger export bans or restrictions, thereby limiting long-term market commitments.

Furthermore, quality standards such as food safety regulations (e.g., SPS and GAP certifications) increasingly influence rice trade. Nguyen et al. (2018) found that Vietnamese exporters face significant challenges in penetrating high-end markets such as the EU and Japan due to stringent pesticide residue requirements and traceability standards. Therefore, compliance with international quality norms is a decisive factor in expanding export markets.

Several comparative studies offer insights into how different countries manage rice export strategies. In Thailand, export-oriented policies coupled with strong branding (e.g., Thai Hom Mali rice) have helped establish a premium market position (Poapongsakorn & Pantakua, 2015). In contrast, India's reliance on low-cost, high-volume exports has made it highly sensitive to changes in global demand and freight costs.

For Vietnam, rice export strategies have evolved through phases: from centrally controlled quotas and minimum export price schemes in the early 2000s to more market-oriented mechanisms post-2010. Doan and Le (2021) emphasize that policy liberalization, infrastructure development in the Mekong Delta, and strategic market diversification have been pivotal in maintaining Vietnam's strong presence in global rice trade.

While the above studies provide a comprehensive understanding of the factors affecting rice exports, few have specifically modeled the interplay of domestic and international variables in a unified econometric framework tailored for Vietnam. Moreover, the role of global uncertainties (e.g., pandemics, climate change, geopolitical tensions) in shaping rice export decisions remains underexplored in the Vietnamese context. This study seeks to fill these gaps by empirically analyzing both demand- and supply-side factors affecting Vietnam's rice export decisions using a time-series approach.

3. THEORETICAL FRAMEWORK

This study aims to identify the key determinants influencing rice export performance in Vietnam. In this context, rice exports are treated as the dependent variable, while the explanatory variables include total rice production, domestic demand, international demand, rice yield, domestic price, and export price. The proposed functional relationship is specified as follows:

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

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Each variable is grounded in economic theory and supported by prior empirical studies, as elaborated below:

3.1. Rice Production (Supply-Side Determinant)

Rice production is a crucial supply-side factor that directly influences the quantity of rice available for export. In a closed economy, excess production may result in declining domestic prices, discouraging further production. However, in an open economy like Vietnam, surplus rice 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 (Proxy: Domestic Consumption)

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

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

3.3. International Demand (Proxy: World Rice Exports)

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

Rice 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 rice 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 Price (Retail Price)

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

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

3.6. Export Price (Proxy: Average World Rice Price)

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

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Kumar et al. (2008) suggests that in certain contexts, higher export prices can also signify higher quality and stronger demand, thereby positively influencing exports.

The conceptual model underscores the multifaceted nature of rice export performance. Supply-side factors such as production and yield are expected to exert a positive influence, while domestic price and demand may constrain export volumes. International demand acts as a key enabling force, whereas export prices 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 rice export performance over time.

4. DATA AND METHODOLOGY

Annual time series data has been used for the sake of analysis for period 1980-2010. There are total 31 observations because for a time series analysis there should be at least 30 observations if we want to estimate reliable results. Seven variables have been used in the study for the estimations. These variables include rice exports, rice production, rice domestic consumption, rice world total exports, rough rice yield, producer price of rice and export price of rice. Data is taken from United States Department of Agriculture (USDA)5 and Food and Agriculture Organization (FAO)6 Domestic consumption is taken as proxy for domestic demand of rice while world total rice exports are taken as a proxy for international demand of rice. Most of the variables are in quantities like rice exports, rice production, domestic consumption of rice, world total exports of rice and rough rice yield while others are average annual prices so there is no problem of nominal or real terms with these variables.

4.1. Unit Root Test (Augmented Dickey Fuller)

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.

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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.

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

lX_t = log of rice exports

lQ_t = log of Rice production

lDC_t = log of domestic consumption of rice which is used as a proxy for domestic demand of rice.

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

lY_t = log of rough rice yield

lXP_t = log of export price of rice

lDP_t = log of producer price of rice

Unit Root Test

Augmented-Dickey Fuller (ADF) Results

Table 1: Augmented Dickey Fuller Unit Root Results

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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 Price
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 price 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 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

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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)

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.

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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)

All the coefficients are statistically significant and exhibit the correct signs according to the theory except coefficient of domestic consumption of rice which is taken as a proxy for domestic demand has the right sign but statistically it is insignificant.

Domestic production of rice has a statistically significant and highly positive impact on the rice exports of Vietnam. According to the coefficient of rice production a 1% increase in rice production will lead to a 1.08% increase in rice exports of Vietnam. So production is a main supply side determinant and it has a major impact on rice exports.

Coefficient of domestic consumption which is used as a proxy for domestic demand is statistically insignificant though it has the correct sign.

Coefficient of world's total rice exports which is used as a proxy for international demand of rice is statistically significant and has the correct sign. According to this a 1% increase in world's total rice exports (international demand) will cause an increase of 0.54% in rice exports of Vietnam. So it is also a strong determinant.

Coefficient of yield also exhibits the correct positive sign and also it is statistically significant. Coefficient of yield suggests that a 1% increase in rough rice yield will lead to an increase of 1.45% in rice exports of Vietnam holding all other factors constant. This coefficient has the strongest impact on rice exports among all the determinants.

Coefficient of export price has also correct sign and also statistically significant. This coefficient suggests that a 1% increase in the export prices of Vietnam rice will lead to a decrease of 0.26% in rice exports of Vietnam.

Domestic price coefficient is also statistically significant and exhibits correct sign. According to this coefficient a 1% increase in domestic price of rice in Vietnam will cause a 0.38% decrease in overall rice exports of Vietnam. Domestic Price has a stronger effect than the export price.

Results show that all the variables used in the study have correct signs and all are significant except one variable which is domestic consumption of rice.

Vector Error Correction Model

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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

Based on the updated data for the period 2020-2024, Vietnam's rice export sector has demonstrated significant growth, reinforcing its position as the world's third-largest rice exporter. In 2023, Vietnam exported approximately 8.13 million metric tons of rice, generating around $4.78 billion in revenue, marking a 35% increase from the previous year . This upward trend continued into early 2024, with exports reaching 3.23 million tons valued at $2.08 billion in the first quarter alone.

Despite this impressive performance, challenges persist. In 2024, the rice planting area decreased to 6.9 million hectares, and production slightly declined to 42.08 million tons . Furthermore, the re-entry of India into the global rice market after lifting export restrictions in late 2024 has intensified competition, leading to a 30% drop in Vietnam's rice export prices.

To sustain and enhance Vietnam's rice export growth, the following policy recommendations are proposed:

Enhance Agricultural Productivity: Invest in high-quality seeds, modern farming techniques, and efficient irrigation systems to increase yield per hectare. Providing training and support to farmers can facilitate the adoption of these practices.

Improve Quality Standards: Implement stringent quality control measures to meet international standards, thereby increasing the competitiveness of Vietnamese rice in global markets.

Diversify Export Markets: Expand into new markets beyond traditional ones like the Philippines and China to reduce dependency and mitigate risks associated with market fluctuations.

Stabilize Export Prices: Avoid imposing additional tariffs and taxes on rice exports to maintain price competitiveness. Government support in the form of subsidies or incentives can help stabilize prices.

Invest in Research and Development: Allocate resources towards R&D to develop resilient rice varieties and innovative farming solutions that can adapt to changing climate conditions and pest challenges.

By addressing these areas, Vietnam can not only maintain but also strengthen its position in the global rice market, ensuring long-term sustainability and economic benefits for its agricultural sector.

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