

Impact efficiency of trade agreements on Vietnam's rice export

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ABSTRACT

This paper conducted an in-depth assessment on the efficiency of the impacts of trade agreements on rice exports during the period from 2000 to 2015. Based on the secondary data published by the General Statistics Office of Vietnam and the World Bank, the study employed random boundary gravity model to quantify the capacity of Vietnam to exploit rice export potential when participating in trade agreements, or in other words, to estimate the inefficiency in operation of rice export activities of Vietnam under the impact of trade agreements. The results show that rice export activities have not promoted well (at a low level) the impact of the trade agreements that Vietnam has participated in and not all trade agreements have a trend to increase the capacity to exploit rice export potential. Since then, this study provides some recommendations to improve the impact of trade agreements on rice exports in developing countries including Vietnam.

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1. Introduction

Although the impact of trade agreements on Vietnamese rice exports is recorded at a low level and even not all trade agreements have a positive impact, the need to adapt to the impact of such agreements is completely grounded (Tran et al., 2019). However, the study of Tran et al. (2019) was just to measure the impacts of the trade agreements and several related determinants on Vietnam's rice exports. The use of gravity models is popular in studies of commercial activities including exports (Do, 2006; Tu & Dao, 2008; Nguyen et al., 2011; Nguyen et al., 2015). These studies aimed at quantifying the scale of international trade and also revealed some disadvantages. Firstly, the use of this model also assumes that the two-way trade scale of Vietnam with other countries is always at the potential level and that scale is explained by some fundamental variables such as gross domestic product (GDP) of Vietnam, GDP of Vietnam's importing countries, exchange rates, geographical distances, and population. In fact, the scale of trade between Vietnam and other economies will often be below the potential because this model has not evaluated the impact of institutional, policy or infrastructure determinants of importing and exporting countries. In addition, this also means that the estimates that those studies used for Vietnam's international trade potential compared to partner economies will be inaccurate. Secondly, in the gravity model, researchers often consider geographical distance as the only factor that hinders or appeals trade relations between Vietnam and other economies and ignoring the impact of governments' trade policies, which do not really indicate the role of national institutions and policies in promoting and exploiting Vietnam's international trade potential, which made policy implications from existing studies still limited to some extents. Thirdly, the use of gravity models ignores the consideration of different contribution roles of determinants influencing international trade scale in different periods and with different partner economies, making the

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contribution of researches into policy formulation for each period is limited. In overall, these disadvantages will also be difficult to avoid when applying the traditional gravity model to examine export activities in an industry, thereby making it difficult to propose accurate judgments about industry export activities.

Therefore, following the study of Tran et al. (2019), this study employs random boundary gravity model based on structural gravity model with Vietnam rice export data which was formed during the period of 2000-2015 to allow the dissolution of ineffective part of rice commodity trading activities between Vietnam and partner countries. This indicator is defined by the difference between the actual value of rice exports achieved in reality and the potential that Vietnam can achieve. The structural gravity model is applied because it has been developed recently and supported by solid theoretical foundations (Tran et al., 2019).

2. Literature Review

The concept of efficiency is presented by Mayes et al. (1994) as a company or industry that can produce by using minimum of expected resources or inputs and can maintain competitiveness in a long time. In terms of evaluating the efficiency of a certain factor, it will be determined by comparing the level of efficiency between two different periods of time, or comparing the actual and expected level of efficiency, or comparing the efficiency between different entities operating in geographical areas or with different efficiencies under the influence of several determinants (Wholey & Hatry, 1992). In order to achieve comparability, the impact needs to be measured and thereby to see whether past decisions are effectively made, how the business or industrial structure is, and how they can be used effectively (Duzakin & Duzakin, 2007). The concept of efficiency measurement was started by Farrell (1957), with two basic techniques used as parameters and non-parameters.

Meesen and Broeck (1977) firstly developed the parametric method (Stochastic Frontier Analysis - SFA). The study added some limits of symmetric errors to their boundary model. The random boundary functions can also be estimated by the normal Least Squares Estimation method or the maximum likelihood estimation "MLE" (Coelli, 1995). The linear programming model, also called the non-parametric method developed by Charnes et al. (1978) and Fare et al. (1985) based on the assumption of convexity, is also known as the Data Envelopment Analysis (DEA) which aims to determine the production of marginal efficiency and thereby estimate the efficiency measurement. The DEA model can be measured using the input-output production function and be modified to calculate the increase or decrease in the rate of profit (Banker et al., 1984). In addition, when there are data on prices and quantities, the allocation efficiency can be calculated.

Each method has certain limitations. SFA as a parametric approach requires necessarily assumptions regarding effective distribution, error distribution. However, these assumptions allow to test statistical hypotheses of most marginal forms and can test the hypothesis of the importance of inefficient distribution in the model. Therefore, SFA can be applied to data with measurement errors, missing variables and fluctuations in weather conditions. Meanwhile, DEA is a non-parametric approach, using linear programming to build boundary from actual observation and has control over arbitrary variables and does not need hypotheses about effective distribution. However, Ouellette and Vierstraete (2004) and some other studies demonstrated that non-arbitrary inputs are present in all areas that require environmental variables in the DEA model. Although DEA can take all the fluctuations from marginal to ineffective, this hypothesis is questionable when there are some noises in data (Coelli, 1995). Therefore, DEA is preferred when studying industries with controlled environmental determinants.

In agriculture, the study of Chapman et al. (1999) with farm-level data in Australia used two different DEA models, i.e. a model to calculate yearly efficiency and a model to estimate total productivity factor. Battese and Corra (1977) applied SFA for Australian farm-level data emphasized the importance of both one-sided errors and symmetric errors, which means both non-effective technical and random effects are significant. Battese and Coelli (1988) adopted panel data and assumed a general distribution of one-sided error and found significant differences in inter-state technical efficiency. In addition to using the gravity model popularly in studies of commercial activities including exports, using random boundary gravity models were also included to estimate potential commercial capabilities of economies. In this case, the commercial potential is understood as the maximum level or scale of trade that can be achieved on the border in terms of free trade, i.e. there is no barrier between countries on all other determinants such as institutions, laws, shipping costs, etc. (Kalirajian, 1999; Armstrong et al., 2008). In addition, this model also contributes to overcome the disadvantages of the traditional gravity model, which is the wrong format and inaccurate estimation because the residuals are subject to variance and non-normal distribution (Matyas, 1997; Matyas, 1998; Kalirajian & Singh, 2008). On the basis of a comparison of actual trade size and potential, these studies show the level of efficiency in international trade activities of countries and can be applied to a sector's trade or a specific industry. In this study, we applied random boundary gravity model with national level data (not enterprise level) in the case of Vietnam.

3. Research Methodology

3.1. Data collection

This research used panel data during the period from 1998 to 2015 with the cross-section includes Vietnam and 60 countries which are Vietnam's rice import markets with a total proportion of over 90% total amount of Vietnamese rice exported. Specific data is sourced and presented in the Table 1, below:

Table 1
Source of Research Data

No.	Data	Source
1	Total rice export volume and value of Vietnam in the years	Vietnam Food Association https://www.vietfood.org.vn/
2	- Gross domestic product at current prices of Vietnam (GDPvn) and of countries (GDPim) - Consumer price index (CPI) - Final spending of countries (EXP) - The value of agricultural production in Vietnam and in the world over the years	World Bank http://www.worldbank.org/
3	- Rice area and output of Vietnam over the years (1998 - 2015) - Vietnam's export volume and value to each country over the years (1998 - 2015)	General Statistic Office https://www.gso.gov.vn/xnkhk/
4	- Vietnam's rice area and production before 1998 - Vietnam's rice export volume and value before 1998	Published articles
5	The distance between the capital of Hanoi and the capital of countries (DIST), the geographical position (adjacent to the sea - landlock, common border with Vietnam - contig) of the countries, the colonial history of the countries (colony)	http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp
6	Trade agreement dummy (=1 if the country enters into a trade agreement from the effective date)	(http://www.trungtamwto.vn/fta)

3.2. Data processing

The level of efficiency in international trade of countries can be estimated by using gravity model with random boundary estimation methods (Kalirajian, 1999; Kalirajian & Findlay, 2005; Armstrong et al., 2008). This model assesses the impact of both country-bound factors, which are not only the distance between those countries but also related institutional, policy, political and social determinants. These countries are based on the method of random marginal production function analysis developed by Aigner et al. (1977) and Meesen and Broeck (1977). In this way, two-way trade turnover between economies is difficult or even never reached the potential level (a basic assumption used in the traditional gravity model), but instead there always exists a certain level of inefficiency in trade between economies. This means that the actual trade revenue between economies is always below the potential level (Kalirajian, 2008). The research model is illustrated as below:

$$\ln X_{ij} = \ln f(Z_i; \beta) \exp(v_i - u_i) \tag{1}$$

In which, X_{ij} is the export value of country i to country j , $f(Z_i; \beta)$ is a function of determinants influencing two-way trade potential (Z_i), and β is the vector of estimated parameters. The error u_i has one-sided distribution (non-negative) which is the combined effect of economic disparities resulting from institutional, political and social determinants (Anderson, 1979), this is the effect that makes the difference between the actual level and the potential in trade of goods. This error is often assumed to have a semi-standard distribution or a truncated normal distribution. A random 2-sided error that measures the influence of other variables is ignored and is often assumed to follow a normal distribution. This model can be estimated using traditional OLS methods. However, the maximum reasonable estimation method (MLE) is often used to minimize bias due to variance error and errors that do not follow normal distribution. The level of commercial efficiency is measured by the difference between actual and potential trade scale. It is not only influenced by policies that restrict or promote cross-border trade of countries but also the impact of policies or institutions and the way to promote or restrict trade and investment or economic integration among countries (Armstrong et al., 2008). This model allows to overcome the fundamental disadvantages of the classic gravity model, in which the trade turnover is always at a potential level and thus helps to more accurately estimate the two-way trade potential between economies. It also allows estimation of inefficiencies in trade activities between economies. Empirically, the estimation models of random boundary gravity can be developed based on partial equilibrium equations obtained from structural gravity models. With the aim of evaluating Vietnam's rice export activities, the research team applied the following random boundary gravity model:

$$\ln X_{ij,t} = a_0 + a_1 \ln GDP_{vn,i,t} + a_2 \ln EXP_{j,t} + (1 - \sigma) \ln \tau_{ij,t} + v_{ij,t} - u_{ij,t} \tag{2}$$

$$(1 - \sigma) \ln \tau_{ij,t} = \beta_1 \ln DIST_{ij} + \beta_2 CNTG_j + \beta_3 CLNY_j + \beta_4 LLOCK_j + \sum_k \kappa_k RTA_{j,t} + \beta_6 BTA_{j,t} + \tilde{\tau}_{ij,t} \tag{3}$$

In which:

a_0 is the intercept, and $a_j, \beta_j \in \mathbb{N}^{++}$ are the parameters to be estimated in the gravity model;

$X_{ij,t}$: Vietnam's bilateral rice export value to the economy j ;

$GDP_{vn,t}$: Vietnam's gross domestic product;

$EXP_{j,t}$: Total final consumption expenditure of the economy j

$DIST_{ij}$: The geographical distance between Vietnam and the economy j measured by the distance between Hanoi and the capital of the partner countries;

$CNTG_{ij}$: Dummy variable takes value 1 if Vietnam and the economy j share border lines and zero in other cases;

$CLNY_{ij}$: Dummy variable takes value 1 if Vietnam and the economy j share the same colonial system before and zero in other cases;

$LLOCK_j$: Dummy variables receive value 1 if the economy j is not adjacent to the sea and zero in other cases;

$TRA_{ij,t}$ and $BTA_{ij,t}$ dummy variables of multilateral and bilateral integration receive value 1 if Vietnam and the economy j participate in Regional Trade Agreements and take effect at time t and zero in other cases;

$\tilde{\tau}_{ij,t}$ represents other factors influencing bilateral trade costs of $\tau_{ij,t}$.

$v_{ij,t}$ is a random error that follows the normal distribution rule.

$u_{ij,t}$ is a non-negative error, one-sided distribution, reflecting the inefficiency in exploiting bilateral trade potential between Vietnam and the economy j . In essence, $u_{ij,t}$ will reflect all the effects of constraints, restricting trade in rice products between Vietnam and partners. This component is influenced by institutional variables, trade, political and social policies of the two countries.

Structural parameters K_k and β_6 measure the effects of multilateral and bilateral free trade agreements on Vietnam's bilateral trade flows and partner economies.

In our opinion, the export scale in general or any product between the two countries in particular cannot exceed the potential level. Government policies can only be aimed at minimizing inefficiencies in trade and promoting export scale to near-potential levels. Therefore, in the model assessing the impact of policy variables on the efficiency of bilateral trade potential exploitation, we need to assume that $u_{ij,t}$ should be divided into two components and are expressed as:

$$\sigma_{u_{ij,t}}^2 = \exp(\gamma_0 + \omega_{ij,t}) \quad \text{or} \quad \ln \sigma_{u_{ij,t}}^2 = \gamma_0 + \omega_{ij,t} \quad (4)$$

In which:

The parameter γ_0 reflects the average variance of ineffective components in export activities of Vietnam and partner countries. $\omega_{ij,t}$ is a random component of the non-effective variance component that represents the random fluctuations of the Vietnamese economy and the partner economy that hinder or negatively affect export transactions between the two countries. This component is assumed to follow the normal distribution rule.

4. Results and Discussion

4.1. Impact of integration on rice export of Vietnam

Hypothesis tests for parameters in the marginal model and ineffective model can be done using the general logical test λ as follows:

$$\lambda = -2[L(H_0) - L(H_1)]$$

$L(H_0)$ is the log-likelihood value of the constrained model considered as the original hypothesis H_0 , and $L(H_1)$ is the logarithmic value of the general model (unbound). This statistical test has an approximate distribution of chi-square with J degrees of freedom where, J is equal to the difference between the corresponding parameters in the original hypothesis and the hypothesis. Testing the semi-standard distribution and the dead end of the inefficient component shows that it is impossible to reject the H_0 hypothesis at the traditional statistical significance levels, and then we can conclude that the average value of the inefficient part is zero. Therefore, the research team estimates and compares the model with the semi-standard distribution and exponential distribution with the mean not for the inefficient component.

Table 2 provides the results of estimating the random boundary gravity model in which the $u_{ij,t}$ components are assumed to comply with the semi-standard distribution rule. Table 3 presents estimation results with the assumption of $u_{ij,t}$ components assumed to follow the exponential distribution rule. Column (1) illustrates the estimated results for the dependent variable that Vietnam's rice export value does not control the time for variance, and column (2) has variance control over time. In

general, the obtained results show that the sign and the magnitude of the estimated coefficients are stable and there is no significant difference between the two models.

The estimation results show the existence of ineffective components at traditional statistical significance levels. LR test shows that hypothesis H_0 ($H_0: \sigma_u = 0$) is strongly rejected at 1% statistical significance. The parameter γ_0 is also statistically significant in most models with assumptions about the semi-standard distribution and the distribution of non-effective components in bilateral rice trade.

The estimated coefficients of the final consumer expenditure variable are negative and statistically significant at the levels of traditional significance that indicate the elasticity of Vietnamese exports of rice with consumption expenditure (EXPim) of partner country is less than 0, rice is a secondary commodity.

Table 2

Estimated results with the assumption u_i follow the semi-standard distribution

Variables	(1) ln_Bil_rice	(2) ln_Bil_rice
ln_GDPvn	0.885* (0.497)	0.623 (0.466)
ln_EXPim	-0.0997*** (0.0331)	-0.118*** (0.0328)
ln_DIST	-0.301** (0.134)	-0.272** (0.126)
Contig	-0.478 (0.516)	-0.655 (0.498)
Landlock	-2.686*** (0.302)	-2.581*** (0.311)
colony	-1.028*** (0.322)	-1.090*** (0.312)
WTO	0.276 (0.284)	0.373 (0.244)
GSTP	1.132*** (0.177)	1.107*** (0.168)
AFTA	0.133 (0.328)	0.344 (0.339)
AIFTA	-1.067 (0.805)	-1.170* (0.701)
ACFTA	2.523*** (0.390)	2.184*** (0.400)
AKFTA	0.629 (0.843)	0.857 (0.770)
AJFTA	-0.986* (0.518)	-1.059** (0.487)
AANFTA	-0.487 (0.562)	-0.300 (0.569)
BFTAs	-0.528 (0.787)	-0.552 (0.803)
Constant	-0.0475 (12.52)	6.695 (11.86)
$\ln \sigma_v^2$	-0.223 (0.211)	-0.629 (0.671)
$\ln \sigma_u^2$	2.433*** (0.0846)	2.388*** (0.0800)
Log likelihood =	-1761.392	-1753.3567
Prob >= chibar2 (LR test of $\sigma_u = 0$)	0.000	0.000
Observations	816	816
Year FE	No	Yes

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The results of the estimation of the gravity model randomly note that geographical distance is an obstacle to rice export activity at the 5% significance level. Non-contiguous countries make trade transaction costs increase and reduce Vietnam's rice export value by about 3%. Sharing the border is not recognized as having an impact on rice export performance at the traditional statistical significance level. The influence of colonial relations on rice exports also significantly reduced rice export value at strong statistical significance levels.

Table 3Estimated results with the assumption u_i follow the rule of exponential distribution

Variables	(1) ln Bilex rice	(2) ln Bilex rice
ln_GDPvn	0.665 (0.481)	0.289 (0.489)
ln_EXPim	-0.116*** (0.0328)	-0.123*** (0.0327)
ln_DIST	-0.360** (0.148)	-0.338** (0.142)
contig	-0.581 (0.491)	-0.654 (0.486)
landlock	-2.735*** (0.284)	-2.657*** (0.278)
colony	-0.913*** (0.299)	-1.032*** (0.301)
WTO	0.437 (0.275)	0.645** (0.272)
GSTP	1.268*** (0.172)	1.203*** (0.170)
AFTA	0.214 (0.344)	0.341 (0.339)
AIFTA	-0.508 (0.831)	-0.810 (0.759)
ACFTA	2.368*** (0.380)	2.210*** (0.385)
AKFTA	0.184 (0.749)	0.572 (0.743)
AJFTA	-0.973** (0.476)	-1.053** (0.463)
AANFTA	-0.543 (0.487)	-0.437 (0.484)
BFTAs	-0.426 (0.727)	-0.430 (0.735)
Constant	5.689 (12.14)	15.10 (12.31)
$\ln \sigma_v^2$	0.288** (0.139)	-0.0607 (0.432)
$\ln \sigma_u^2$	1.381*** (0.122)	1.381*** (0.115)
Log likelihood	-1755.93	-1748.9429
Prob >= chibar2 (LR test of $\sigma_u=0$)	0.000	0.000
Observations	816	816
Year FE	No	Yes

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The dummy variable Join-WTO, taking value of 1 after Vietnam joined the WTO in early 2007, is included in the model to measure changes in data structures that are statistically significant at traditional significance levels with the assumption u_i follows the rule of exponential distribution and has variance control over time, which indicates that this integration process has boosted Vietnam's actual export value by about 0.64%. The GSTP dummy variable indicates that Vietnam's actual rice export value to developing GSTP countries is larger than that of other countries with strong statistical significance. The random gravity model did not recognize the influence of AFTA groups on Vietnam's rice exports, the participation in signing AKFTA, AANFTA was also not shown to have impact in the model. Meanwhile, the ACFTA trade agreement has a significant positive impact on Vietnamese rice exports. The ASEAN-Japan Agreement limits rice exports to a large extent, AIFTA has a negative impact on the assumption that u_i follows the semi-standard distribution rules and has variance control over time but does not record to have an impact on the assumption of exponential distribution rules. For exporting of this item, bilateral FTAs between Vietnam and Japan and Chile have no influence at the theoretical significance level.

4.2. Exploiting rice export potential when Vietnam joins trade agreements

Exploiting Vietnam's rice export potential by region and by free trade agreements is shown in Table 4 as follows.

Table 4

Exploiting the potential of rice exports by trade agreement and by region in the rice export model

REGION	<i>u</i> exponential distribution				<i>u</i> semi-standard distribution			
	PERIOD				PERIOD			
	Before agreement	After agreement	Before WTO	After WTO	Before agreement	After agreement	Before WTO	After WTO
WTO	-	-	33.13	33.56	-	-	22.43	23.10
GSTP	-	-	31.54	33.41	-	-	20.87	23.35
AFTA	-	-	32.08	30.01	-	-	21.18	21.61
EVFTA	-	-	35.19	22.65	-	-	24.20	11.77
EAEU	-	-	33.13	-	-	-	22.43	-
TPP	-	-	33.83	30.81	-	-	23.00	19.99
RCEP	-	-	32.93	29.85	-	-	21.78	21.40
TRADE AGREEMENT			-	-	-	-	-	-
AIFTA	33.38	33.50	-	-	22.73	24.60	-	-
ACFTA	33.66	31.39	-	-	22.81	23.00	-	-
AKFTA	33.35	33.97	-	-	22.73	24.30	-	-
AJFTA	33.39	33.38	-	-	22.72	24.45	-	-
AANFTA	33.30	34.69	-	-	22.75	24.06	-	-
BFTAs	33.37	35.23	-	-	22.82	24.48	-	-

Joining WTO slightly improved the capacity to exploit Vietnam's rice export potential (Table 4). Before joining WTO, according to the model of exponential distribution, the actual bilateral export value of Vietnam only reached 33.13% of the potential level, after joining WTO, this figure is 33.56 %. According to the standard distribution model, WTO also brought positive signals from 22.43% to 23.10% respectively before and after Vietnam's accession to WTO. However, this result shows that the level of exploitation of Vietnam's rice export potential is still not high when Vietnam joins the WTO. Exploiting benefits from trade agreements for rice exports is still relatively low. Calculation results with the assumption that *u* hat distribute show that, on average, Vietnam only takes advantage of about 33.4% of potential export value that can be obtained before signing free trade agreements between ASEAN and 6 important trading partners (ASEAN + 6). This figure dropped to 33.3% after these trade agreements officially took effect. However, with assumption of *u* semi-standard distribution, the ability to exploit rice export potential increases from about 22.7% before signing up to about 24% after the agreements take effect. Table 5 shows the potential of rice export by country in the rice export model.

Table 5

Exploiting the potential of rice export by country in the rice export model

NATIONS	<i>u</i> exponential distribution				<i>u</i> semi-standard distribution			
	ASEAN+6		BFTAs		ASEAN+6		BFTAs	
	Before agreement	After agreement	Before agreement	After agreement	Before agreement	After agreement	Before agreement	After agreement
India	15.71	0.38	-	-	8.21	0.24	-	-
China	43.58	55.99	-	-	30.82	48.66	-	-
Korea	5.48	19.23	-	-	2.04	8.53	-	-
Japan	54.95	42.23	55.47	39.32	44.83	33.11	45.68	29.88
Australia	25.02	45.29	-	-	11.63	26.94	-	-
New Zealand	5.45	16.83	-	-	1.65	5.78	-	-
Chile	-	-	14.87	24.48	-	-	7.11	12.56

Among the participating countries signing with ASEAN + 6, Vietnam takes advantage of the potential for better rice exports to China, Japan and Australia compared to India, South Korea and New Zealand (Table 5). Under the assumption of u exponential distribution, the calculation data shows that Vietnam can take advantage of about 43.58% of rice export potential with China, 54.95% with Japan, 25.02% with Australia, only 15.71% with India, only 5.48% for Korea and 5.45% for New Zealand in the period before the agreement takes effect. After the free trade agreements with these countries take effect, exploiting the export potential is mostly at high levels in countries apart from India and Japan. With the assumption of u semi-standard distribution, the calculated data before the trade agreements take effect show that Vietnam takes advantage of about 30.82% of the potential of rice export trade with China, 44.83% with Japan, 11.63% with Australia, only 8.21% with India, South Korea 2.04% and the lowest is 1.65% with New Zealand. Exploiting the potential of Vietnam's actual rice exports increases with most countries after free trade agreements with these countries take effect and also except for India and Japan. It is noteworthy that although Vietnam well exploits the potential of rice exports with China, that effect is not derived from the ACFTA regional agreement. For bilateral agreements, Vietnam makes good use of the potential for rice export to Chile after the agreement comes into effect but with Japan, although exploiting the export potential well before the Vietnam-Japan agreement but after the agreement comes into effect, this exploitation capacity has decreased. On average, Vietnam exploits about 33% of the actual export value of rice compared to the potential that can be achieved with the assumption of u exponential distribution, or about 22% of the actual export value compared to the Potential can be achieved with the assumption of the semi-standard distribution of u . Vietnam's capacity to exploit rice export potential has fallen below these average levels since 2007, after which it has increased but in the three years from 2013 to 2015, there has been a downward trend.

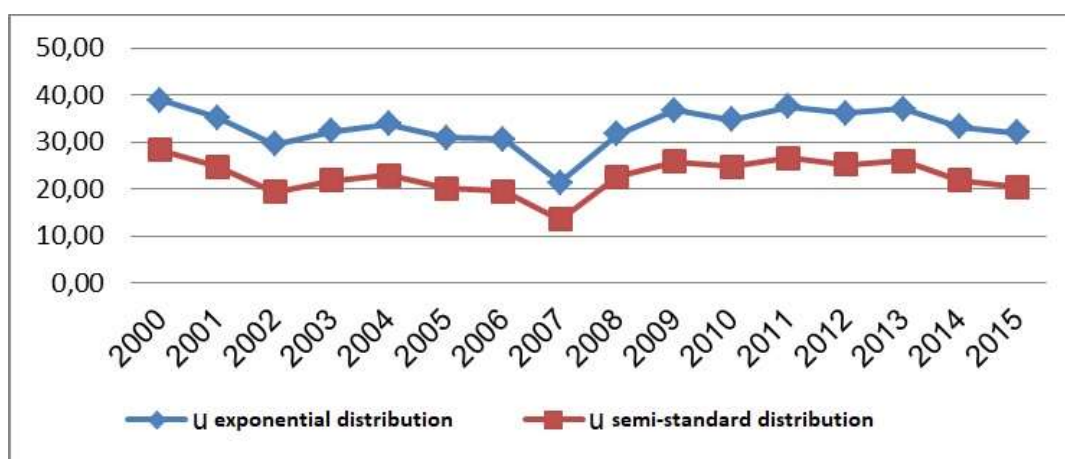


Figure 1. Exploiting the potential of rice exports in the period of 2000-2015

The data of Figure 1 above shows:

(i) There is an inefficient component in rice export transactions between Vietnam and partner countries. On average, Vietnam exploits about 22% - 33% of the potential export value of rice that can be obtained corresponding to the assumptions of the standard and exponential distribution of non-commercial component. Vietnam's capacity to exploit rice export potential has fallen below the average levels in 2007.

(ii) Although Vietnam's capacity to exploit rice export potential for ASEAN + 6 trade agreements remains low (assuming u exponential distribution only take advantage of about 33.4% of the potential value of rice export before signing, reduced to 33.3% after these agreements officially took effect, with the assumption that u semi-standard distribution, the corresponding figure is 22.7% increased to 24%) but the efficiency of exploiting rice export potential of Vietnam has improved somewhat when Vietnam joined WTO (comparing before and after Vietnam joined WTO from 22.43 to 33.13% compared to the level of potential to 23.10% - 33.56%).

(iii) Vietnam takes advantage of the potential for rice exports for China, Japan and Australia better than India, South Korea and New Zealand before trade agreements take effect but when it comes into force, the China, South Korea, Australia and New Zealand countries have increased their capacity to exploit Vietnam's rice export potential. This does not happen to India and Japan.

However, there are some issues raised by the data in the tables and figures above:

(i) Due to the type and quality of Vietnam's rice exports are slow to improve to create a difference or superiority, the impact of trade agreements that Vietnam has acceded not to fully affects Vietnam rice export. Therefore, Vietnamese rice is mainly exported to familiar customers (some Southeast Asian countries, China, Korea ...). Although Vietnamese rice exports in large quantities to some other new markets, it is not the members that Vietnam has signed a trade agreement with (African countries

like Ghana, Ivory Coast and others). Meanwhile, some member countries in trade agreements that Vietnam is a member of Vietnam import rice with decreasing quantity (such as Japan and India).

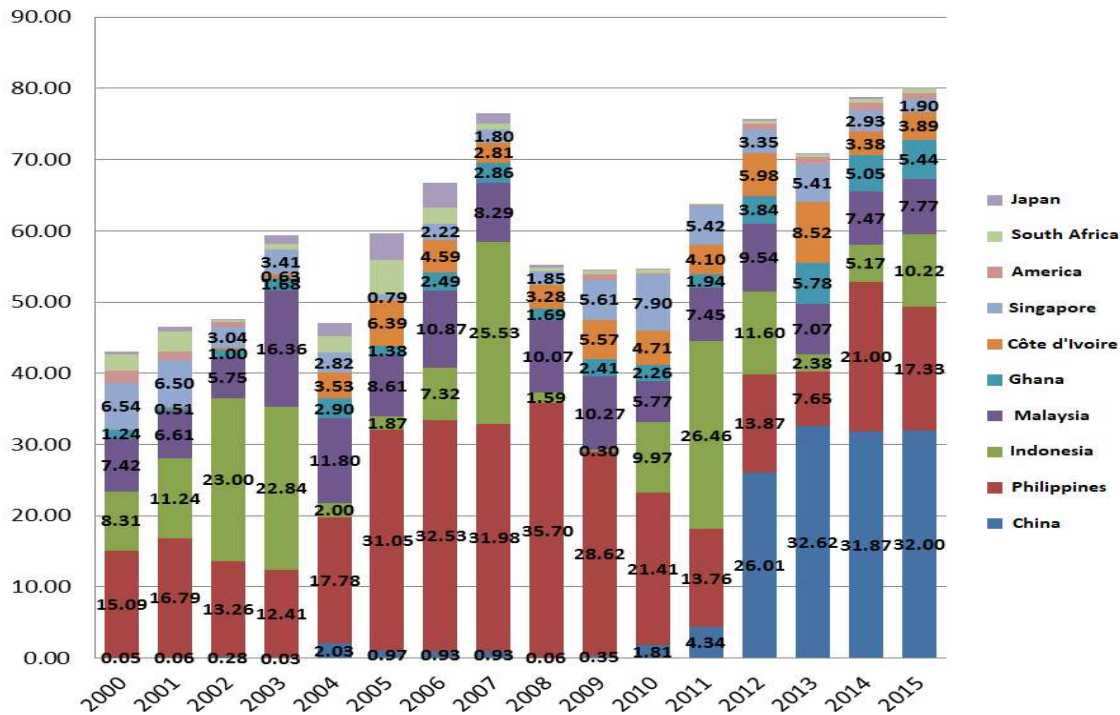


Figure 2. Structure of Vietnam's rice export market (% compared to total volume)

(ii) Vietnam's rice exports do not meet the technical standards, animal and plant quarantine and import and export procedures set out in the negotiation of trade agreements, especially the criteria made by each country, which makes Vietnamese rice exports increasingly difficult to penetrate into "difficult" markets or markets that are already capable of producing and exporting "good" rice varieties, including member states. Therefore, it is more difficult to conclude trade agreements with these countries.

In short, this research shows that trade agreements that Vietnam participates in have an impact on Vietnam's rice exports, but Vietnam's rice exports have not yet exploited these effects efficiently. Therefore, in order to increase the efficiency of these impacts, the rice industry in general and export rice in particular need to take advantage of the benefits that trade agreements bring to meet rice exporting standards when Vietnam becomes a member of trade agreements. This study emphasizes again the conclusions in the study of Tran et al. (2019) but is more developed when quantifying the potential of exploiting rice export potential when Vietnam joins trade agreements, or in other words, how much Vietnam's rice exports actually exploit from rice export potential when affected by the trade agreements that Vietnam has signed. Since then, rice exports not only need to adapt well to the contents of trade agreements but also need to have a good coordination between clients involved in rice export from central to local levels, between policies rice exports including export rice product policy; policies to promote rice trade; tax and non-tax policies, exchange rate policies, restructuring policies of the rice industry; between the subjects participating in rice export and the policy to effectively exploit the rice export potential when Vietnam joins trade agreements.

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