IMPACT OF INCOME ON SPECIALTY RICE CONSUMPTION IN VIETNAM

● CAO MINH TUAN - THACH KEO SA RATE - VO THI ANH NGUYET

ABSTRACT:

The consumption of high-quality products tends to increase as economies develop and incomes rise. This study investigated the consumption patterns of specialty rice in Vietnam. This study explored the factors affecting specialty rice consumption. The study's data was collected from 9.104 households through the 2018 Vietnam Household Living Standards Survey. The statistical analysis revealed that 13.95% of Vietnamese households consume specialty rice. The probit model showed a positive correlation between income levels and the likelihood of consuming specialty rice. Additionally, the ordinary least squares model demonstrated a positive relationship between income levels and the quantity of specialty rice consumed. These findings underscored the importance of implementing programs that promote the production and consumption of specialty rice to enhance the value of Vietnam's rice industry.

Keywords: rice consumption, specialty rice, income impact.

1. Introduction

More than 50% of people worldwide consume rice as a staple food, which provides more than 20% of all calories (Tao & Li, 2018). Previous studies show that the income elasticity of rice consumption is gradually declining as a result of economic growth and household income growth (Muhammed et al., 2023). As a result, the number of high- and middle-income countries' per capita rice consumption has decreased (Pingali & Abraham, 2022). Low-income consumers frequently consume much rice in their diets. However, as their income rises, people change their diet to include more items high in protein or vitamins and minerals, such meat, poultry, and vegetables (Bairagi et al., 2020).

Rice can be divided into specialty rice and ordinary rice based on the grain's size, shape, and variety (Pradana-Lopez et al., 2021). Specialty rice typically has long, thin, fragrant grains, which give the rice a soft texture when cooked. Ordinary rice, on the other hand, has a short, dark grain that, after cooking, is frequently stiff and dry. Can higher consumer income lead to more specialized rice purchases? This issue should be considered because the rice consumption pattern has important policy implications for food security.

Vietnam had 7,28 million hectares of rice-growing land under cultivation, and 42,76 million tons of rice were produced in 2020 (General Statistics Office of Vietnam, 2021). Vietnam is also a major global rice exporter. Besides, Vietnam is among the most significant rice-consuming countries in the world (Tu et al., 2021). The economy of Vietnam has progressed significantly, and per capita income levels are rising. The Vietnamese government must make greater investments to expand specialty rice production if domestic consumers are to gradually consume more high-quality specialty rice instead of low-quality ordinary rice. This study examines the factors that affect Vietnamese people's consumption of specialty rice. The findings provide valuable information for formulating rice production and consumption policies in Vietnam.

2. Methodology

2.1. Data collection

The research analyzed information from the 2018 Vietnam Household Living Standard Survey (VHLSS). The data was collected from 9.396 households across 3.132 communes in Vietnam, using stratified random sampling to ensure the population's representativeness. After removing observations with insufficient information regarding specialty and ordinary rice consumption, the sample was reduced to 9.104 households. Of these households, 1.270 consumed specialty rice, accounting for 13,95% of the sample.

2.2. Data analysis method

The consumption of specialty rice was divided into two cases: consumption (1) and no consumption (0), making the dependent variable a binary option. The Probit model was used to explore the variables influencing household consumption of specialty rice. The Probit model is represented as follows:

$$E(Y|X_i) = P(Y = 1|X_i) = F(\beta_0 + \beta_i X_i) = \int_{-\infty}^{\beta_0 + \beta_i X_i} (2\pi)^{1/2} e^{\frac{\beta_0 + \beta_i X_i}{2}} d(\beta_0 + \beta_i X_i) \quad (1)$$

Where, Y is the dependent variable, equals one if the household consumes specialty rice and zero otherwise. βiXi is represented as follows:

$$\beta_i X_i = \beta_1 Income + \beta_2 Member + \beta_3 Age + \beta_4 Gender + \beta_5 Ethnicity + \beta_6 Education + \beta_7 Urban + \beta_8 Poverty + \varepsilon \quad (2)$$

Where, Income (million Vietnamese dongs/person/month) represents the monthly average per capita income; Member (person) signifies the number of family members; Age (years) indicates the head of the household's age; Gender (male = 1) equals to one for male and zero otherwise; Ethnicity (Kinh = 1) equals one if the household belongs to the Kinh ethnic group; Education (in years) denotes the household head's years of education; Urban (urban area = 1) equals to one for households in urban areas; Poverty (poor = 1) equals one if the household is classified as poor; β_i represents the regression parameters; and ε is the model error.

The ordinary least squares (OLS) model was applied to estimate factors affecting rice consumption. The OLS model is written as follows:

$$Y = \beta_0 + \beta_1 Price + \beta_2 Income + \beta_3 Member + \beta_4 Age + \beta_5 Gender + \beta_6 Ethnicity + \beta_7 Education + \beta_8 Urban + \beta_9 Poverty + \varepsilon \quad (3)$$

Where, Y (kg/person/month) is the rice consumed per capita. Price (1.000 Vietnamese dongs/kg) is the average price of rice for each type of rice. The rice price was calculated as the average per kilogram (1.000 Vietnamese dongs/kg), which was determined by dividing the total expenditure on rice by the quantity consumed during the month. The other variables are described similarly in equation (2).

3. Results and discussion

3.1 Statistic results

Table 1 summarizes the socioeconomic characteristics and rice consumption patterns of the sample households. The mean per capita monthly income was estimated to be approximately 3,84 million Vietnamese dongs, with an average food expenditure of 1,03 million Vietnamese dongs per person per month. Specifically, the mean monthly payment on rice was 107,46 thousand Vietnamese dongs per person, accounting for approximately 13,6% of the total monthly food expenditure of the household. The average total rice consumption per person per month was 8,75 kg. The average household size was 3,74 people, and the typical head of a household was 52,5 years old. The majority of households (83%) belonged to the Kinh ethnic group, and 75% of household heads were male. The household head had 7,52 years of education, 30% of households were in urban areas, and 9% of households were considered to be poor.

2.2 Factors affecting household rice consumption

Table 2 presents the factors affecting the probability of Vietnamese people using specialty rice. Variables such as income per capita, age of household head, ethnicity, education of household head, and living in urban areas positively impacted the use of specialty rice. In other words, the likelihood of consuming specialty rice was higher in households with high income, elderly household heads, high levels of education, Kinh ethnic group members, and residents of urban areas. Meanwhile, the household head's gender and poor household variables negatively impacted on the probability of using specialty rice. This implies that male-headed or poor households consumed less specialty rice than female-headed households.

Table 1. Household demographics and monthly food expenditure per person

Variable	Total (n = 9,104)	Consume specialty rice (n = 1.270)	Do not consume specialty rice (n = 7.834)
Monthly per capita income (1.000 Vietnamese dongs)	3.845,65	6.153,52	3.471,51
Monthly food expenditure per capita (1.000 Vietnamese dongs)	1.036,89	1.393,59	979,06
Monthly total rice expenditure per capita (1.000 Vietnamese dongs)	107,46	113,11	106,55
Percentage of rice expenditure in food expenditure (%)	10,36	8,12	10,88
Monthly consumption of total rice per capita (kg)	8,75	7,48	8,95
Number of family members (person)	3,74	3,63	3,75
Household head age (year)	52,5	53,1	52,4
Household head gender (male = 1)	0,75	0,71	0,75
Household head ethnicity (Kinh = 1)	0,83	0,96	0,81
Years of schooling of household head (year)	7,52	9,25	7,25
Urban households (urban area = 1)	0,30	0,51	0,27
Poor households (poor = 1)	0,09	0,01	0,10

Source: Own calculation based on the VHLSS 2018.

Table 2. Vietnamese people's ability to use specialty rice: Probit regression results

Variable	Coefficient	Standard error	dy/dx
Monthly per capita income (million Vietnam dongs/person/month)	0,066***	0,005	0,013***
Number of family members (person)	0,017	0,012	0,003
Household head age (year)	0,004***	0,001	0,001***
Household head gender (male = 1)	-0,094**	0,041	-0,019**
Household head ethnicity (Kinh = 1)	0,420***	0,068	0,083***
Years of schooling household head (year)	0,057***	0,006	0,011***
Urban households (urban area = 1)	0,257***	0,038	0,051***
Poor households (poor = 1)	-0,355***	0,105	-0,070***
Constant	-2,517***	0,126	
Number of observations	9,104		
LR chi2(8)	834,66		
Prob > chi2	0,0000		
Pseudo R2	0,1135		

*Notes: ***, ** indicate statistical significance at 1% and 5%, respectively.*

The OLS regression analysis on the variables influencing rice consumption are shown in Table 3. The regression model was tested for heteroskedasticity using the White Test. The White Test's 0,000 p-value rejected the homoskedasticity hypothesis. This implies that heteroskedasticity exists in the regression model. To address this, the regression analysis used robust standard errors. The

Table 3. Factors affecting rice consumption: OLS regression results

Variable	Total rice consumption		Specialty rice consumption	
	Coefficient	Robust SE	Coefficient	Robust SE
Rice price (1.000 Vietnamese dongs/kg)	-0,093***	0,019	-0,305***	0,027
Monthly per capita income (million Vietnamese dongs /person/month)	-0,059***	0,011	0,028*	0,017
Number of family members (person)	-0,584***	0,032	-0,411***	0,053
Household head age (year)	0,010***	0,003	0,016***	0,006
Household head gender (male = 1)	0,626***	0,081	0,308*	0,183
Household head ethnicity (Kinh = 1)	-1,419***	0,098	-0,425	0,390
Years of schooling household head (year)	-0,090***	0,010	-0,052***	0,028
Urban households (urban area = 1)	-1,679***	0,078	-0,718***	0,182
Poor households (poor = 1)	-0,436***	0,127	0,185	0,661
Constant	12,953***	0,262	13,310***	0,702
Number of observations	9.104		1.270	
F (8; 9095)	207,56		35,35	
Prob > F	0,0000		0,0000	
R-squared	0,1704		0,2016	

*Notes: ***, **, * indicate significance levels at 1%, 5% and 10%, respectively.*

Pro > F index, which equals 0,0000, indicates that all the models are statistically significant.

In the total rice consumption model, the variables such as rice price, per capita income, number of household members, Kinh ethnicity, education level, urban area, and poverty, negatively impacted the household's total rice consumption. In other words, these factors reduced the household's rice consumption. Particularly, a rise in rice prices or per capita income decreased the amount of rice consumed. On average, households in urban areas consumed 1.679 kg of rice per month, less than those in rural areas. Additionally, families of the Kinh ethnic group consumed approximately 1.419 kg less rice per month than households from other ethnic groups. The average amount of total rice consumed fell as education increased. Poor families consumed less rice compared to households that were not poor. The household head's age and gender had a positive impact on the average total rice consumption.

In the specialty rice consumption model, the variable of income per capita positively affected consumption. This suggests that households tended to consume more specialty rice as income increased. The price variable of specialty rice was negatively impacted, but with a greater magnitude than in the total rice consumption model. This result aligns with the theory that luxury goods' elasticity is higher than normal goods, where specialty rice can be considered a luxury good and ordinary rice a normal good.

Similarly, Hopio & Reyes' (2017) investigation into Filipinos' consumption of specialty rice discovered that age had a favorable impact on that consumption. However, the direction of the influence of other factors on consumption of specialty rice in Vietnam is different from the Bangladeshi survey on the consumption of high-quality rice (Mottaleb & Mishra, 2016). In Bangladesh, families with many members, higher-educated household heads, and residents of urban areas tend to consume more high-quality rice. In the Philippines, highly educated people also consumed more specialty rice (Hopio & Reyes, 2017).

These variables, however, had the opposite effect in the case study in Vietnam. In other words, in Vietnam, households with many members, highly educated household heads, or families in urban areas were less likely to consume specialty rice. Meanwhile, Vietnamese households headed by men consumed more specialty rice than those headed by women. Conversely, male-headed households consumed less high-quality rice in Bangladesh than female-headed households (Mottaleb & Mishra, 2016).

4. Conclusion

This study examined the factors influencing rice consumption in Vietnam using data from the 2018 VHLSS dataset. The findings shed light on the consumption patterns of specialty rice, revealing important implications for policy and economic development in the country. Specialty rice was consumed by approximately 13,95% of households in Vietnam. These households allocated a higher proportion of their expenditure to rice, although the percentage of rice expenditure in their total food expenditure was lower compared to households consuming ordinary rice.

The probit model results indicated that high-income families tended to consume specialty rice. The OLS model demonstrated a negative relationship between income and total rice consumption, while specialty rice consumption exhibited a positive correlation with income. This suggests that as income levels increase, individuals tend to reduce their overall rice consumption but have a stronger preference for specialty rice.

These findings emphasize the requirement for targeted policies to promote both the production and consumption of specialty rice in Vietnam. It is crucial for producers to shift their focus from yield-centric approaches to prioritizing the production of high-quality rice varieties that satisfy consumer demand. Collaboration between the Vietnamese government, research agencies, and farmers is essential in creating and disseminating these specialty rice varieties that are suitable for local production conditions. In terms of consumption, the number of specialty rice consumers in Vietnam is relatively modest. By encouraging the utilization and production of specialty rice, Vietnam's rice industry can enhance its value ■

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TÁC ĐỘNG CỦA THU NHẬP ĐẾN TIÊU DÙNG GẠO ĐẶC SẢN Ở VIỆT NAM

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TÓM TẮT:

Việc tiêu thụ các sản phẩm chất lượng cao có xu hướng tăng khi nền kinh tế phát triển và thu nhập của người dân tăng lên. Nghiên cứu này khám phá mô hình tiêu dùng gạo đặc sản của người dân Việt Nam. Nghiên cứu sử dụng thông tin của 9.104 hộ gia đình từ bộ dữ liệu Khảo sát mức sống hộ gia đình Việt Nam (VHLSS) năm 2018 để phân tích các yếu tố ảnh hưởng đến việc tiêu thụ gạo đặc sản. Kết quả thống kê cho thấy có 13,95% hộ gia đình có tiêu thụ gạo đặc sản. Kết quả mô hình probit cho thấy có mối tương quan tích cực giữa mức thu nhập và khả năng tiêu thụ gạo đặc sản. Kết quả của mô hình hồi quy cho thấy có mối quan hệ tích cực giữa mức thu nhập và lượng gạo đặc sản được tiêu thụ. Những phát hiện này nhấn mạnh tầm quan trọng của việc thực hiện các chương trình thúc đẩy sản xuất và tiêu thụ gạo đặc sản để nâng cao giá trị của ngành lúa gạo Việt Nam.

Từ khóa: tiêu thụ gạo, gạo đặc sản, tác động thu nhập.