#### VIET NAM'S FOOD CONSUMPTION PATTERNS: FACTORS TO CONSIDER

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#### Abstract

The structure of food demand and consumption behavior between the rich and the poor has a remarkable difference. The poor consume more grain while the rich spend more on safer and more nutritious food. We try to describe a general picture about the food demand of Vietnam's households in some specific aspects. Several findings summarized as follows: the distribution system of Vietnam's commodity has not operated effectively yet; the richest households' proportion of spending on food rich in protein and nutrients is higher than other income groups, and the proportion of expenditure on cereals (rice) is still high for the poorest households; the richest households are willing to pay higher prices for all food commodities than the poorest ones. The result of Almost Ideal Demand System (AIDS) model estimation reveals that estimated coefficients of the richest households are greater than zero for all food commodities, which indicates that the food demand for these commodities will increase when the price rises. On the other hand, the poorest households have three estimated coefficients less than zero including rice, pork and vegetables. It is the fact that a rise in the price of rice, pork and vegetables will have a negative impact on the food demand for these commodities' prices vary. The poorest households' demand is price elasticity of food items namely rice, pork and vegetables.

**Keywords:** food consumption, behavior, income, demand, pattern, household, price. JEL classification: D1, D11, D12, L66, P36.

# MÔ HÌNH TIÊU DÙNG THỰC PHẨM CỦA VIỆT NAM: NHỮNG YẾU TỐ CẦN XEM XÉT Tóm tắt

Cơ cấu nhu cầu lương thực và hành vi tiêu dùng giữa người giàu và người nghèo có sự khác biệt rõ rệt. Người nghèo tiêu thụ nhiều thực phẩm ngũ cốc hơn trong khi người giàu chi tiêu nhiều hơn cho thực phẩm an toàn hơn và bổ dưỡng hơn. Chúng tôi cố gắng mô tả một bức tranh tổng thể về nhu cầu thực phẩm của hộ gia đình Việt Nam ở một số khía cạnh cụ thể. Một số kết luận như sau: hệ thống phân phối hàng hóa của Việt Nam chưa hoạt động hiệu quả; tỷ trọng chi tiêu cho thực phẩm giàu đạm và dinh dưỡng của các hộ giàu nhất cao hơn các nhóm thu nhập khác và tỷ trọng chi tiêu cho ngũ cốc (gạo) ở các hộ nghèo nhất vẫn còn cao; những hộ giàu nhất sẵn sàng trả chi phí cao hơn cho tất cả các mặt hàng thực phẩm so với những hộ nghèo nhất. Kết quả ước lượng mô hình AIDS cho thấy hệ số ước lượng của các chộ giàu nhất đều lớn hơn 0 đối với tất cả các mặt hàng lương thực; tức là nhu cầu lương thực đối với những mặt hàng này sẽ tăng khi giá tăng. Ngược lại, các hộ nghèo nhất có ba hệ số ước tính nhỏ hơn 0 gồm gạo, thịt lợn và rau. Thực tế là việc giá gạo, thịt lợn và rau tăng sẽ tác động tiêu cực đến nhu cầu lương thực khi giá của những mặt hàng này thay đổi. Nhu cầu của các hộ nghèo nhất co giãn theo giá của các mặt hàng thực phẩm như gạo thịt lợn và rau.

Từ khóa: tiêu dùng thực phẩm, hành vi, thu nhập, nhu cầu, hình mẫu, hộ gia đình, giá cả.

#### 1. Introduction

In recent years, the economy of Vietnam has faced a great deal of difficulties and economic growth has slow down by 2020. The inflation rate was very high, which caused many problems not only for enterprises but also for people living in Vietnam, especially for the poorer. Generally, the increase in prices of goods and services affects the budget share of them. Share of total daily life's expenditures on food is a useful indicator to evaluate the standard of living. The higher this indicator is, the lower the living standard is.Vietnam is a poor country, so this share is still high. Expenditures on non- food goods and services of the richest household group was 7.4 times as high as the poorest household group. In addition, the inflation in Vietnam in recent years has led to the increase in price of goods. The poor people have to face economic shock, so they have some strategies for consumption. Studies on food demand help to provide good information about how the demand responds to changes in price of foods, as well as changes in household income.

The special income household groups have different consumption behavior when a change in price of food product and change in their income (Elisabeth et al., 1995). Kaufman P.R. et al with more detail when showed that the low-income household groups choose the food that are economical and lower quality in order to save their money (Kaufman et al., 1997). Huang and Lin (2000) also stated that the demand for each kind of food is different across different incomess of the households (Linh Vu Hoang, 2009). As the case in Vietnam seafood, beef, and poultry are still luxurious goods to the poor household because they have to spend their money for the other demand to distribute their financial resources effectively, some poor households even do not have enough money for the daily demand, they try and try to live day by day over. Especially, if the economy is in a high inflation situation and the

price level of commodities is increasing so they find it more difficult to reduce the budget share. The main problem for the rich household is not the price level of goods; they also care about food safety, the quality of products and taste. Contrary to poor households, the necessary goods for them in Vietnam are still in shortage. Shortage of food such as rice, corn, daily basic food, etc. Recently, consumption in Vietnam has witnessed many notable fluctuations and development trends. Economic recovery: After the COVID-19 pandemic, Vietnam's economy has had a positive recovery. GDP growth reached a stable level, with many sectors such as manufacturing, exports and services recovering strongly. Increased consumer spending: Per capita income increased, leading to an increase in consumer spending, especially in areas such as travel, entertainment and shopping.

In Vienam, there are some studies relating to the food demand for example Anita R., Jame L., (2010), Linh Vu Hoang (2009), Eozenou P. (2004), Linh Vu Hoang, and Eozenou used the data of Vietnam Living Standard Survey to estimate the commodities demand, whereas Anita et al used International Comparison Program data of 114 countries to calculated the cross price elasticities of demand across 114 countries (Anita et al., 2010), (Kuo et al., 2000), ( Eozenous, 2004). Most of the studies do not focus on income group comparison axcept for the work (Hung le Van, 2008). However, in Hung's work, the data used are out of date. Since then, there have been many changes in standard of living as well as consumption habits, due to the change in demography as well as economic conditions. It therefore calls for a new investigation about food consumption patterns using more updated data. Research from Can Tho University (2023): This study focuses on consumer interest in safe food with clear origins. Food safety concerns have fueled demand for products with safety certifications, such as VietGAP and GlobalGAP.

Research from the Central Institute for Economic Management (CIEM) (2023): Convenience foods such as fast food and processed foods are increasingly popular, especially among young people and white-collar workers. The main reason is convenience and time saving. In this paper, I utilize the data VHLSS 2010, the period of economic downturn. With quantitative analysis, my thesis will point out the differences in the response of households about food demand according to different income groups. From the results, we can calculate the elasticity of food demand with respect to price and expenditure. The results could be useful policy makers when dealing with the issues of socio economics. Additionally, the study on the price elasticity of demand can be a useful tool to determine tax policies on commodities.

## 2. Methodology

The method of Almost Ideal Demand System (AIDS) was used to estimate demand by different income household groups in Vietnam, the model was obtained from consumer behavior theory so it satisfied the constraints of demand theory. The Almost Ideal Demand System (AIDS) is an econometric model used to analyze consumer demand and expenditure patterns. It was developed by Angus Deaton and John Muellbauer in their seminal 1980 paper, "An Almost Ideal Demand System." The AIDS model has become a widely used tool in empirical studies of consumer behavior due to its flexibility and theoretical foundation in consumer demand theory. Below is an overview of the AIDS model, its formulation, and its applications.

## 2.1. Background of the method.

Household is the agent who consumes goods, and they are economical agent so their choice is the optimal choice. They decide what product to buy, how quantity to buy depending on their hobby, their income can be used for consumption, depending on the price of these products, and shopping purposes. Food decisions of households are limited by the above factors and these factors create a household's demand. Therefore, we can express the household's demand as below.



Thus, input of the system includes: Income of the households, income can be consumed, predilection, taste, shopping purpose, and price of product. Output of the system is the goods demand of the households.

There are two approaches relating to studies on demand model including the single equation methods and complete demand systems. However, the single demand equation approach has some drawback when it does not recognize how to allocate the budget share between different goods and do not satisfy the restriction of demand theory that are limitation of expenditure and budget constraint.

#### 2.2 Model specification.

The household want to maximize their utility so they have to choose various price commodities, and its quantities with a limited budget. For simply, we consider the case that one household purchase only two goods denoted by  $q_1$  and  $q_2$ , the problem of household can be represented by:

MaxU =  $\sum_i \alpha_i \log(\lambda_i q_i) q_i \ge 0; p_i \ge 0; \lambda_i \ge 0$ 

Which U(q<sub>1</sub>,q<sub>2</sub>) is the utility function and p<sub>1</sub> and p<sub>2</sub> are price of two good (in this paper the unit value will be treated as price), m is the income of household, By maximizing utility U subject to the constraint of budget  $m = \sum_i \lambda_i p_i q_i$ . We get the demand equation (Marhallian demand equation) when we solve this problem of household

$$q_i = \alpha_i m / [(\alpha_{1+}\alpha_2)\lambda_i * p_i]$$

We denote  $v_i$  and  $w_i$  are the unit value and budget share of food i respectively. So unit value and expenditure share of household can be calculated as below:

$$v_i = \frac{y_i}{q_i} \qquad \qquad w_i = \frac{y_i}{y}$$

In which  $y_i$ ; y; and  $q_i$  are expenditure on food  $i^{th}$ ; total food expenditure at home and the quantity of food  $i^{th}$  respectively.

# 3. Results and discussion

The own-coefficient of the budget share is -0.048, its sign is negative. It means that when an increase  $\ln v_{pork}$  10 percent leads to a budget share for pork demand decreases 0.0048 percent.

	All case		Poorest group Middle income		income	Richest group		
-	~ ~ ~		0.6		gro	group		
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Rice	0.0050	0.99	-0.0725	-5.76	0.0297	2.61	0.0504	4.75
Pork	0.0413	7.02	-0.0048	-0.39	0.0521	4.01	0.0841	6.05
Chicken	0.0367	10.04	0.0687	7.7	0.0351	4.39	0.0420	5.31
Oil	0.0380	32.14	0.0350	11.9	0.0378	15.42	0.0365	13.27
Egg	0.0664	31.13	0.0589	11.26	0.0712	16.81	0.0503	12.55
Soya curd	0.0024	2.29	0.0016	0.53	-0.0013	-0.57	0.0047	2.62
Vegetable	0.0056	7.04	-0.0011	-0.56	0.0036	2.64	0.0110	6.5
Fish sauce	0.0175	23.32	0.0140	7.42	0.0162	11.5	0.0206	10.68

 Table 1: Result of estimation AIDS model (unit value coefficient)

(|t|>1.97 the coefficients have significant at 95%)

From estimated results equation (7), we have obtained the price coefficients; table 2 presents the effect of price on the budget share of the households. In the overall sample, and the richest households the coefficients are positive, it means that the increase in price will lead to budget share for its food rice, the food demand increases. The unit value coefficient of rice, pork, vegetable for the poorest case were negative, it shows that the enhancement of its price lead to reduce the demand for these demand or the share of budget for these foods will decrease. Evidently, disparities exist in food consumption behavior between the wealthiest and the most impoverished individuals, as indicated by the positive unit value coefficients for the richest group and the negative coefficients for rice, pork, and vegetables in the case of the poorest group.

For the middle income household, almost all coefficient estimators are positive (Soya curd has not statistical meaning at 95%). So it can be said that when price or unit value increase, demand for these commodities also increases.

#### Influence of the income on the demand

Similarly, We get the estimator of expenditure coefficient that affects the budget share of the household. Table 2 lists the estimator from the AIDS model.

	all case		Poorest group		Middle income group		<b>Richest</b> group	
	Coef.	t- sta.	Coef.	t- sta.	Coef.	t- sta.	Coef.	t- sta.
Rice	0.0136	128.2	0.0156	57.0	0.0139	55.34	0.0115	53.96
Pork	-0.0074	-61.6	-0.0078	-28.7	-0.0080	-28.06	-0.0061	-21.5
Chicken	-0.0070	-77.8	-0.0081	-28.7	-0.0070	-32.61	-0.0063	-30.14
Oil	0.0002	5.52	-0.0003	-2.57	0.0004	5.13	0.0004	4.75
Egg	0.0004	9.58	0.00002	0.2	0.0003	3.3	0.0005	6.78
Soya curd	0.0004	9.76	0.0002	2.02	0.0004	4.36	0.0004	5.89
Vegetable	0.0007	19.0	0.0006	7.71	0.0005	8.05	0.0007	9.24
Fish sauce	0.0006	16.8	0.0005	5.52	0.0006	9.13	0.0007	10.6

Table 2:	Influence	of exp	penditure	on f	food	demand

According to the estimation result, the expenditure coefficient of all cases (all samples, poorest group, middle income group, richest group) show that there are positive effects for pork, chicken and negative effect for rice, egg, soya curd, vegetable, fish sauce. It means that when expenditure per capita at home rises then the share of the budget, or its demand will decline.

Comparisons of own price elasticities, and expenditure elasticity of food's demand among different income groups. (/t/>1.97 the coefficients have significant at 95%)

In the field of macroeconomics, Mankiw articulated that "the price elasticity of demand quantifies the responsiveness of quantity demanded to price variations. The elasticity of demand is higher when substitutes are readily available or when a product is considered a luxury rather than a necessity. The formula for price elasticity of demand involves calculating the percentage change in quantity demanded in relation to the percentage change in price. In cases where quantity demanded changes proportionately less than the price, resulting in an elasticity value below 1, demand is deemed inelastic. Conversely, if quantity demanded changes proportionately more than the price, yielding an elasticity value exceeding 1, demand is considered elastic".

Ep ->	x	Perfectly Elastic
Ep  >	1	Elastic
Ep  =	1	Unitarily Elastic
Ep  <	1	Inelastic
$\mathbf{E}\mathbf{p} =$	0	Perfectly Inelastic

Table 3: Indicator for elasticity measurement

The price and expenditure coefficients obtained from estimation results will be used to compute the demand with elasticity. It describes the elasticity of demand respect to own-price across income of households. In addition, the cross price elasticities of demand are placed in the appendix. Almost all of own price elasticities for Marshallian's demand have the right sign except for the own price elasticity of egg, own price elasticity of the egg demand was positive for all cases (all samples, poorest, middle-income group, and richest group). The outcome was suitable for that in other studies (Linh Vu Hoang, 2009), they revealed the price elasficities of non-cereal food demand was positive.

	whole	Poorest	Middle	Richest	
Rice	-1.003	-1.15	-0.95	-0.88	
Pork	-0.83	-1.01	-0.79	-0.66	
Chicken	-0.64	-0.02	-0.64	-0.59	
Oil	-0.28	-0.40	-0.26	-0.31	
Egg	0.68	0.55	0.87	0.27	
Soya curd	-0.92	-0.95	-1.05	-0.84	
Vegetable	-0.77	-1.04	-0.85	-0.54	
Fish sauce	-0.42	-0.53	-0.46	-0.32	
Source: Calculation from estimated results of AIDS mode					

<b>Table 4:</b> Comparisons of own price elasticities among different income gro
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There are many differences in response to food demand when changes in price due to income of the household group. All price elasticities of food demand of the poorest group were more elastic than that of the richest group.

For the whole country, except the rice commodity, all food commodities has an elasticity coefficient lower than one in absolute, it implies that these food commodities are inelastic. Rice is an integral commodity of Vietnam's household, its elasticity coefficient approximate to 1, this is

the unitarily elastic, and it means that the proportions change in rice's price equal to the proportion change in quantity of its demand.

From the calculated estimation, we can recognize the significantly different response of food demand between various income household groups due to changes in price. When the price is altered, the poorest household's reaction is more sensitive than that of the richest household. We consider the poorest household group, the elasticities of demand respect to own price of some food commodities were larger than 1 in absolute value for example the elasticity coefficient of rice, pork and vegetable were equal to -1.15, -1.01, -1.04 respectively, in other words the demand for these foods commodities were rather sensitive to price. For instance, the own price elasticity of vegetables was -1.04 suggesting that a 1 percent rise in vegetable's price caused a decrease in vegetable demand equivalent to 1.04 percent. We consider the middle income household group, the own price elasticity for Soya curd were larger than 1 in absolute value, suggesting the own-price elasticity of Soya curd was elastic, and the other commodities demand was inelastic. Unlike the poorest household and

middle income household, all elasticities coefficient of the richest household class were lower than 1 in absolute in a range -0.88 to 0.27, and almost demand for the commodities was less elastic than these of the other income class (poorest household, and middle income household). In other words, food demands of the rich were less affected when changes in price.

Although in recent years, Vietnam's economy has achieved a lot of significant achievement both economic growth, and poverty reduction, Vietnam is still the poorest in the world. In addition, the gap between poor and rich is being expanded in recent years leading to inequity in goods and service expenditure. Following we will consider the responsiveness in goods and service expenditure between various income groups.

	All	Poorest	Middle	Richest
Rice	1.0291	1.0293	1.0293	1.0295
Pork	0.9706	0.9634	0.9687	0.9789
Chicken	0.9326	0.8858	0.9295	0.9575
Oil	1.0037	0.9957	1.0079	1.0070
Egg	1.0098	1.0005	1.0075	1.0123
Soya curd	1.0121	1.0063	1.0128	1.0145
Vegetable	1.0271	1.0251	1.0227	1.0289
Fish sauce	1.0185	1.0169	1.0214	1.0238

Table 5: Comparison of expenditure elasticity of Food demand by income group.

In the overall samples, when there is a boost in income, the demand for commodities of rice, oil, soya curd, vegetable, and fish sauce also go up. Whereas expenditure for pork, chicken also increased but with a lower rate of income growth for example expenditure elasticity for pork and chicken were 0.97 and 0.93 respectively.

In general, the commodities for all cases (all sample, poorest group, middle-income group, and richest group) were the normal goods due to the all coefficient expenditure elasticities greater than zero. There are not any inferior goods in this research; it is suitable for the case of Vietnam because it is a low-income country. There are a differences between various income groups about expenditure elasticities. Most coefficients were similar about the sign and amount except the case for oil product. Its coefficient of the poorest group was 0.99 (greater than 0, and lower than 1) so oil is normaly good, but in other cases its coefficient greater than 1 (luxury goods). However, it is not enough to conclude that when designing the questionnaire, the given question contains also vegetable oil and edible fat.

## 4. Conclusion

Unsurprisingly, the number of poor people in Vietnam is still high and the gap between the rich and the poor is wider and wider. Moreover, the rate of expenditure on food commodities in the total expenditure of Vietnam's household is problematic, especially for the poor household. The structure of food demand and consumption behavior between the rich people and the poor has a remarkable difference. The poor consume more on grain food while the rich spend more on safer and more nutritious food. The result of AIDS model estimation describes the influence of the price on demand as well as considers the impact of expenditure on food demand and a comparison of own price elasticity, additionally study expenditure elasticity of food demand among different income groups. We try to describe a general picture about the food demand of Vietnam's household in some specific aspects and several finding summaries as follows.

First of all, the distribution system of Vietnam's commodities has not operated effectively yet. This is partly due to underdeveloped transportation system and infrastructure. Goods are transported mainly by road but the road infrastructure has too many problems. The underdeveloped distribution system of goods leads to difficult circulation of commodities. no good connection between producer and consumer. The price rises sharply because of many kinds of fees in the process of commodity circulation, thus causing damage to consumers.

*Secondly*, the richest households' proportion of spending on food rich in protein and nutrients is higher than other income groups, and the proportion of expenditure on cereals (rice) is still high for the poorest households. This shows that the most important food for the poor is rice. Food is their first priority before considering the other expenditures.

*Thirdly*, the richest households are willing to pay a higher cost for all food commodities than the poorest ones. The richest households care about not only the price of goods but also quality of food and food safety.

*Fourthly*, the result of AIDS model estimation reveals that estimated coefficients of the richest households are greater than zero for all food commodities; it indicates that the food demand for these commodities will increase when the price rises. Otherwise, the poorest households have three estimated coefficients less than zero including rice, pork and vegetables. It is the fact that a rise in the price of rice, pork and vegetables will have a negative impact on the food demand for these commodities.

*Finally*, the various income groups have an obviously different response to the food demand when these commodities' prices vary. The poorest households' demand is price elasticity of food items namely price, pork and vegetables. Meanwhile, the richest group achieves the total of elastic coefficients less than one in absolute value, thus those goods are inelastic. The poorest households' food demand is more sensitive to price compared to the households with the highest income.

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