

Research article

Consumption Expenditure of Agri-food in Tanzania

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Abstract

This paper was undertaken to measure consumption expenditure of agri-food in Tanzanian context. The empirical results revealed that socioeconomic factors are significant determinants of households' food consumption expenditure. However, the paper suggested that in order to alleviate food insecurity in the country, formulated food policies should focus much more on the demographic factors of the population.

Keywords: agri-food, consumption,

1. Introduction

A couple of studies have been undertaken to examine consumption pattern in developed and developing world. These studies include: - Angulo, Gil, and Gracia (2001) compare the income elasticity and total calorie intake elasticity in European countries. They observed limited convergence in consumption and suggested that country idiosyncrasies still play an important role. Dholakia and Talukdar (2004) test consumption convergence between the United States and twenty two emerging markets with aggregate consumption and soft drinks consumption. They found that after controlling for income and price, global integration and exposure to the United States accelerate consumption convergence. Konya and Ohashi (2007) find evidence of convergence in OECD consumption patterns with substantial heterogeneity across products / product groups. Convergence in global food consumption and delivery systems is noted by Frazao, Meade, and Regmi (2008) and Regmi, Takeshima, and Unnevehr (2008). Aizenman and Brooks (2008) test the convergence in beer and wine consumption in thirty eight countries. They observed more convergence in wine consumption than in beer consumption. Mitry and Smith (2009) observed convergence in alcohol consumption.

However, on the other hand, a limited number of studies have been conducted in Tanzania to examine consumption pattern of food, this includes: - Ananda et al. (2003) for food consumer demand pattern in Tanzania. They argued that food own price elasticities of demand tend to be inelastic because as price spikes willingness to consume tend to decline due to increase in consumers expenditure share.

In Tanzania income devoted to food consumption expenditure has been shrinking due to increase in the disposable incomes of consumers, resulting into shift from necessities to luxuries consumption (NBS, 2001). This has been influenced by limits to the extra money people spend on food when their incomes rise. Consequently, the proportion of total spending devoted to food declines as income increases (Samuelson and Nordhaus 2008).

Hence, the present paper seeks to examine on how household food consumption expenditure can be influenced by the socioeconomic variables such as household income, price, gender, age, marital status, education, geographical location and size of the household by employing Socioeconomic Influence Model (SIM).

2. Methodology

Types of data

Secondary data on consumption expenditure of agri-food were collected from Household Budget Survey (HBS) conducted in 2007 by the National Bureau of Statistics (NBS) of the United Republic of Tanzania.

Sampling technique

Households were selected from the National Master Sample (NMS) which is nation-wide covering both rural and urban areas. The sample size of 4680 households were selected by systematic sampling method, from 10466 households involved in HBS of 2007 for 21 regions included in the HBS namely; Dar- es -Salaam, Arusha, Dodoma, Iringa, Mbeya, Morogoro, Kilimanjaro, Mwanza, Tabora, Tanga, Kagera, Pwani, Kigoma, Lindi, Mtwara, Mara, Shinyanga, Singida, Ruvuma, Rukwa and Manyara.

Agri-food categories

The 158 food items consumed by the households were categorized into 18 groups. Namely; cereals (paddy, rice, green maize cob, maize grain, maize flour, millet grain, millet flour, sorghum grain, sorghum flour, wheat grain, wheat flour, barley and other cereals). Cereal products (bread, biscuits, buns, cakes, chapatti, macaroni, spaghetti, cooking oats, and other cereal products). Roots and starches (cassava fresh, cassava dry, cassava flour, round potatoes, sweet potatoes, yams, cocoyam, cooking bananas / plantains and other starches). Sugar and sweets (sugar, honey, syrup, jams, ice cream, chocolate and sweets).

Pulses (dry peas, green peas shelled or in pods, dry beans, green beans shelled or in pods, lentils, red grams, green grams, and other pulses). Pulse products (bagia). Nuts (groundnuts in shell, groundnuts shelled, coconuts, cashew nuts, and other nuts). Vegetables (carrots, radishes, beets, turnips, garlic, onions, spinach, lettuce, cabbage, other leafy vegetables, tomatoes, bitter tomatoes, ladies fingers / okra, cauliflower, cucumber, pumpkins, brinjals / eggplant, fresh green pepper, other cultivated vegetables, other wild vegetables, dried vegetables and canned vegetables). Fruits (bananas, oranges, limes, mangoes, avocado, pawpaw, sugar canes, apples, pears, other wild fruits). Meat and poultry products (mutton, beef, mince sausages, pork, pork sausages, goat meat, bacon, other domesticated animals, wild animals, offal (liver, kidney), dried or salted meat, canned meat, and other meat products, chicken, eggs and other poultry.

Milk and dairy products (fresh milk, yoghurt, cream, cheese, canned milk and powder milk). Fish and shellfish (fresh fish, shell fish, fresh dried fish, dried or salted fish/ shellfish fillets, and canned fish / shellfish). Oil seeds and fats (cottonseed oil, groundnuts oils, sesame oil, sunflower oil, olive oil, butter, margarines cooking fat, and other cooking oil). Spices and other foodstuffs (red / black peppers, curry powder and other spices as well as salt, yeast, baking powder, and other foodstuffs). Raw materials for drinks (tea powder, coffee powder, and cocoa powder). Soft drinks (Coca-Cola, Fanta, pepsi, mirinda, juice, mineral water), tea, coffee, cocoa and other beverages. Alcoholic drinks (Kilimanjaro beer, Safari beer, Guinness beer, Castle beer, Ndovu beer, Serengeti beer, other canned / bottled beer, chibuku and other local brews). Tobacco-cigarettes (sportsman, sweet menthol, nyota, snuff, pipe tobacco and other cigarettes).

Model specification

Socioeconomic Influence Model (SIM)

The socioeconomic influence model was adopted from Waheeduzzaman (2011) who used it to study developed and emerging markets in terms of consumption convergence in G7 (U.S, U.K, Japan, Germany, France, Italy and Canada) countries and big emerging markets (BEM) countries (China, Mexico and India).

The empirical model can be expressed as:

$$Y_h = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 D_1 + \beta_4 X_3 + \beta_5 D_2 + \beta_6 D_3 + \beta_7 D_4 + \beta_8 X_4 + \mu_i \dots \dots \dots (1)$$

Where:

Y_h = Household food consumption expenditure (TZS)

X_1 = Household income, X_2 = Food prices, X_3 = Age, and X_4 = Size of the household.

D_1 = Dummy variable for sex (1 = male and 0 = otherwise (female))

D_2 = Dummy variable for marital status (1 = married and 0 = otherwise (unmarried))

D_3 = Dummy variable for education (1= primary and secondary education, 0 = otherwise (college and university education)).

D4 = Dummy variable for geographical location (1 = rural and 0 = otherwise (urban))

α = Intercept

β_i = Parameter to be estimated

μ_i = Error term

3. Results and Discussion

Calibration of Socioeconomic Influence Model (SIM)

Analysis of Variance (ANOVA)

In Table 1 the empirical results revealed that the explanatory variables included in the model predicted significantly well the dependent variable at F-value of 1191.08 which is statistically significant at $Pr < 0.0001$. This implies that households' incomes, food prices, gender, age, marital status, education, geographical locations and households' size are the significant determinants of households' food consumption because all of the regressor variables have nonzero regression coefficients.

Table 1: Analysis of Variance of SIM

Source	Sum of Squares	Mean Square	F- Value	Pr
Model	6.10E12	7.63E11	1191.08*	<.0001
Error	2.99E12	640185606		
Corrected Total	9.09E12			

Note: * F-value is significant at 5% level of significance.

Model summary

In Table 2 the empirical results showed that 67 per cent of variation in households' food consumption expenditure is explained by variation in regressor variables (households' real incomes, food prices, gender, age, marital status, education, geographical locations and households' size) which were included in the Socioeconomic Influence Model (SIM). This implies that socioeconomic factors are the drivers of the households food consumption expenditure by 67 per cent due to the fact that consumption expenditure on food is a function of income, price, and demographic variables such as gender, age, marital status, education, household size, and geographical locations of consumers in the population.

Table 2: Model summary of SIM

Root MSE	25302	R-Square	0.67
Dependent Mean	57567	CV	43.95

Parameter calibrations

In Table 3 the empirical results revealed that if real household income increases by 1 TZS, the household food consumption expenditure would increase by 0.12 TZS per month under *ceteris paribus*. The implication is that increase in food consumption expenditure is less than increase in income due to the fact that food is necessity

good for life. Similar results have been reported by Keynes (1936) that consumption function is determined by income despite the fact that as income rises also consumption rises but consumption increase is not as much as increase in income. On the other hand, if food price spikes by 1 TZS, the household food consumption expenditure would hike by 1 TZS and 61 cents per month under *ceteris paribus*. The implication is that as food price spikes, food consumption expenditure increases, despite a decrease in consumer demand. Similar results have been reported by Sadoulet and de Janvry (1995), they reported that as the price of good increases, the consumers expenditure share used to increase, despite a decrease in consumer demand.

The results in Table 3 revealed that male headed households had lower food consumption expenditure by 138 TZS and 29 cents per month by consuming an actual average of 17809 TZS and 71 cents (17948-138.29) on food; whereas female headed households consume 17948 TZS actual average per month. This implies that male headed households allocate less amount of money on food consumption and allocate much more money on non-food consumer goods such as cars and houses as compared to female headed households who allocate much more money on food consumption because females are very conscious with food nutritious as compared to males.

In Table 3 the empirical results found that as age of the household head increases by 1 year the food consumption expenditure is expected to increase by 28 TZS and 30 cents under *ceteris paribus*. This implies that as the age of the household head went up food budget share is expected to increase because aged household heads allocate much more money on food consumption by shifting from luxurious goods used to consume at their middle age (Table 3).

In Table 3 the empirical results showed that married households lowers food consumption expenditure by 183 TZS and 32 cents per month by consuming an actual average of 17764 TZS and 68 cents (17948 – 183.32) on food, where as unmarried households consume 17948 TZS actual average per month. This implies that married households allocate less amount of money on food consumption per month by allocating much more money on non-food consumer goods like cars, houses, education, and medical care as compared to unmarried households.

Table 3: Parameter calibrations of SIM

Variables	Parameters	Parameter calibrations	Standard error	t-values	Pr-value
Households Food consumption expenditure	α	17948*	1676.93	10.70	<.0001
Households income	β_1	0.12*	0.0049	25.26	<.0001
Food prices	β_2	1.61*	0.02	75.60	<.0001
Gender	β_3	-138.29	1190.29	-0.12	0.91
Age	β_4	28.30	28.93	0.98	0.33
Marital status	β_5	-183.32	1201.12	-0.15	0.88
Education	β_6	1835.71	1017.62	1.80	0.07
rural-urban	β_7	681.56	792.99	0.86	0.39
Household size	β_8	-586.22*	108.17	-5.42	<.0001

Note: * Implies statistically significant at 5% level of significance.

Furthermore, the empirical findings revealed that households headed by primary and secondary education holders; allocate 19783 TZS and 71 cents (1835.71 + 17948) per month higher than the households headed by college and university education holders who allocate 17948 TZS per month on food consumption expenditure. This implies that less educated household heads allocate much more money on food consumption as compared to more educated household heads that allocate less amount of money on food consumption and allocate much more money on luxurious consumer goods like cars and buildings because of their higher incomes (Table 3).

The empirical results revealed that rural households allocate 18629 TZS and 56 cents (681.56 + 17948) per month higher than urban households who allocate 17948 TZS per month on food consumption. This implies that rural household heads allocate much more money on food consumption expenditure as compared to urban household heads who allocate less amount of money on food consumption because of high incomes urban household heads allocate much more money on luxurious consumer goods especially in the city capital Dar es Salaam (Table 3).

In Table 3 the empirical results revealed that as household size increases by 1 person the household food consumption expenditure is expected to lower by 586 TZS and 22 cents. This implies that as the household size increases the food budget decreases as the budget for other needs might have increased considering there is no change in the given budget. This might also be influenced by the money allocated on food consumption is not equal to the number of persons increase in the particular household. However, this is due to the fact that other non-food consumer goods such as medical care, clothes, insurance, and education are highly needed for the wellbeing of the household.

4. Conclusion and Policy Implications

The socioeconomic factors are the significant determinants of households' food consumption expenditure. Hence, food policy with the aim of alleviating food insecurity can be formulated by focusing much more on demographic factors of the population which have direct impact on food consumption expenditure. This can be done through the use of household income and expenditure surveys to identify food consumption based on demographic factors such as age, gender, marital status, income class, and location of vulnerable groups to assess the degree of food insecurity in the country.

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