The Impact of Demographic Factors on Household Expenditures in Education and Health facilities

Robby Timothy Warioba and He Xiaodan

Abstract:

In consideration of significant roles played by consumption patterns in understanding the household living standards and indicating the person's welfare and well-being, this study provides an up to date verification of the impact of demographic factors on consumers' expenditure patterns in education and health in Tanzania. Using cross section data from the 2011-2012 household budget survey, the study empirically analyzed this impact. Three considered demographic factors were found to have a significant positive impact on households spending patterns on education and health services. The findings of this study will increase the economic actors' understanding of the factors determining expenditure patterns and use them to evaluate the consumption and welfare of the population in Tanzania.

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Introduction

Attainment of a sustainable development has become a central issue for the emerging economies. Being the extension to the previous global Millennium Development Goals (2000-2015) Sustainable Development goals (SDGs) constitute a post-2015 development agenda with a vision for equity, peace and security, sustainability and poverty elimination (Todd & Mamdani, 2015). Poverty eradication is among the extreme global challenge and the obligatory prerequisite for the attainment of sustainable development. Tanzania as one of the emerging economy country is also trying hard on making sure that multi-sectorial perspective are encouraged and interconnected to the SDGs for improving the lives of future generations (NBS, 2013). Apart from the fact that there are indicators for the country to reach the drawn map as per National Development vision of 2025 towards making Tanzania a middle-income country; there is still a need to ensure that the goal is reached in reality and not statistically. That means ensuring that the lives of most Tanzanian's truly reflect the middle-income picture of the country. The household living standard can be well understood from the consumption pattern, and the qualities of consumption budget which indicate clearly the household welfare level. Household's food consumption pattern is an important indicator of a person's welfare and well-being. (Chourad, 2012; Reddy, 2010) stressed out that human life is eventually sustained and nurtured by consumption. Consumption obviously contributes to human development when it widens the capabilities and enhances people's lives without affecting other people's well-being. Projections in many business areas and the functioning of the society are significantly influenced by demographic development. Without exact, proper and appropriately structured demographic information, it becomes difficult to make correct decisions and predictions in the field of economics (Vileková & Sabo, 2013). The following are some examples; by measuring income, occupation, education and individual's or family wealth, socioeconomic status is determined. Life stage is established on an individual's age, relationships and family status. Life style is determined by life stage, location, education interests, activities, opinions and socioeconomic status. All these characteristics are also important to businesses since they are taken as predictors of consumer spending trends and can help in understanding consumer behavior and needs.

Based on the marketing theory, the consumer behavior is affected by four major factors namely, cultural, personal, social and psychological (Chand, n.d.). Cultural factors are regularly inborn in consumer's values and decision process and they include culture and social class. Social factors expound the outside influences of others on the buying decisions of consumers. Personal factors on the other hand include variables such as age and lifecycle stage, economic conditions lifestyle and personality. Consumers' demographic characteristics such as gender, income level, age, education level, income level and many others play a significant role in consumers buying decisions and can lead to deviations in the usual patterns of consumer's decision making (Lee & Chien-Chiang, 2005). The importance of demography in studying consumers was discovered by researchers in the 1950's. (Mohan, 2014; Vileková & Sabo, 2013) all agreed that demographic variables are supposed to be incorporated in a model of consumer behavior in their investigation of whether demographic data affects the behavior of the consumer. In considering the above highlighted importance of demographic factors in determining consumer's buying decisions and the fact that there is very little published research on the matter especially for Tanzania. This study then attempts to show the effect of demographic factors on the consumption patterns of the Tanzanian households by testing the hypothesis that demographic factors have influence on the behavior of household consumption. The study will also look at the extent to their effect on expenditure

behavior of the consumer and find out whether they may lead to consumer get maximum utility with the consideration of the axioms of consumer behavior.

Research gap

Considering the fact that, the Household demand for a particular good is completed by two components; consumption per member of the household, and the specific size of the household for that good. And that, the expenditure per household member is determined by per capita income of the household and demographic attributes of households, the author found it useful to empirically analyze the demographic factors influencing family expenditure on education and health services. No much research is done on the effect of demographic factors in Tanzania particularly and the few available studies on the matter worldwide appear to be outdated. Either the available studies looked at the effect of demographic factors on consumer's buying decisions on certain good or goods. Almost all discussions of consumer behavior begin with a theory of individual behavior. This study follow neoclassical convention by assuming that such behavior can be explained by the maximization of a utility function based on suitable constraints. This is based on the fact that the indirect utility function is just the inverse of the expenditure function and vice versa. It is well known that vast of studies have been concentrating on the key determinants of consumer spending, namely, income, price of the product, price of other goods, taste and preference, fashion and many other. Few researchers are interested in this kind of study in consumer behavior due to its complicity both with regard to data availability and analysis.

This particular study goes further by looking at the demographic factors influencing household spending, and linking consumer expenditure to utility maximization which then leads to improvements in the households living standards (Beegle, De Weerdt, Friedman, & Gibson, 2010). This research is likely to widen a deeper understanding of various demographic factors affecting household expenditure in studying the behavior of a consumer. This study discusses on their inclined factors using data on Household budget survey which was conducted by the National Bureau of Statistics in Tanzania. The findings of this study will add to the existing knowledge by exploring the under researched relationships between demographic factors and consumer expenditure patterns. The first section of this paper begins by giving a brief introduction of the study and the research gap. Literature reviewed will be discussed in the following section, followed by the research methodology. Results, conclusions and policy recommendations follow thereafter.

Literature review

Household demand of a certain good comprise of two components: consumption per household member, and the particular size of the household consuming that particular good. Major determinants of expenditure per household member are determined by per capita household income and demographic attributes of households. The question that surfaces is whether demographic factors affect household spending in education and health services. In this section, appropriate literature associated with how demographic factors determine expenditure of the household will be reviewed. The section begins by stressing on the connection between expenditure and utility. In the proceeding sections, it looks at what has been empirically done by various researchers with regard to how household expenditure is affected by demographic factors.

A note on the impact of education and health spending

A key concept in the study of consumer behavior is utility. Utility is the word used to describe the enjoyment or fulfillment or benefit derived by a person from consumption of goods. Total utility is the total satisfaction that a person derives from spending his income and consuming goods,(Mas-Colell & Whinston Michael D., 1997). The relation arises because the consumer's choice sets are assumed to be defined by certain prices and the consumer's income. That is, the consumer chooses a vector of goods to maximize her satisfaction subject to her financial plan that says she cannot spend more than her total wealth. That also means that the consumer will make her consumption decisions rationally. Human capital is being renowned as an instrument of national development in all countries of the world. According to (Oladeji Abidemi , Sankay & Omotayo, 2015; Schultz, 1961) improving the peoples access to education and health services is regarded as one of the key ways of improving the excellence of human resources assuming that both leads the economy to have healthy trained human resources which is necessary for economic growth and development. Considering that there are many components of human capital but education and health are indeed the most important components. (Adekola, 2014) on the other hand stressed out that human capital development remains to be a major substance for economic growth. That then leads to the argument by (Ighodaro & Adefabi, 2011) that human capital development activates economic growth through various factors like improving health facilities, reducing fertility and poverty levels, enhancing the employment opportunities, improving technological development and source of political stability. The development of human capital then increases the number of knowledgeable workers by refining their skills and enabling them to new challenges.

In his analysis of differential effects of health in economic growth (Cooray, 2013) indicated that economic growth is significantly affected by life expectancy at birth only when life expectancy is related to health and education expenditures. Putting it differently, the increase of spending in health and education services lead to a positive and significant impact of health capital on economic growth. (Morrisson, 2002) concluded that Education has a significant impact on health and vice versa, and that a person who cannot acquire medical care for a curable condition undergoes a significant loss in income

One of the important steps in studying consumer expenditure is incorporating demographic factors into household consumption. (Chao, 1991) classified household characteristics into five categories which are: region of residence, household head education, working status of spouse, size of the family, and household head's age, and come with a conclusion that the demographic household characteristics may affect household expenditure on various consumption items to a varying extent. In this particular study, household characteristics have been classified into various categories like, family size, household head's age, sex of head of the household, household head years of education, and family income after tax. The way Demographic factors affect household consumption (the consumer behavior) changes from time to time, it doesn't remain constant in every situation. The behavior of a consumer changes depending on various factors. When there are changes to those factors, the behavior of the consumer also changes. Couple of scholarly articles has dealt with the determinants of buying behavior; this is also seen to be linked to this particular study. Following is the summary of findings from various researches done on the determinants of a consumer expenditure behavior. Various authors identified age, marital status, sex, income, education, family background, family size geographical and psychological factors as among the demographic factors which influences the behavior of the consumer (Gordon, 2015; Kumar,

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2014; Omar, Nazri, Osman, & Ahmad, 2016; Su, Pokhrel, Gbangou, & Flessa, 2006). Claiming of a nonexistent of research on spending on computers (Yin, Devaney, & Stahura, 2019) conducted an exploratory study based on Bryant's (1990) household consumption model, where by income, education and religion were found to have an influence on computer purchase. (Jain & Tendulkar, 2016; Yusuf & Brooks, 2010) in their attempt to answer the question on whether the Engel curves for a given item of expenditure differ amongst occupations, socio-occupational factors were found to be among the major determinants of consumer expenditure patterns.

Either, by distinguishing demographic features the effect of demographic factors on consumer expenditure patterns were further investigated by (Gong, Van Soest, & Zhang, 2005; Paulin, Paulin, & Duly, 2002; Sethi & Pradhan, 2008) where by the consumption spending patterns were found to base on levels of education, household consumption, death rates, birth rates, income expenditure patterns and consumer durable ownership rates. The knowledge of consumer behavior is also very important for manufacturers in order for them to increase their sales and capture the determined share of the market. As the research conducted by (Gordon, 2015; Kumar, 2014; Omar et al., 2016; Vileková & Sabo, 2013) in their attempt to understand that effect on the behavior of consumers. There are various demographic factors that can affect family expenditure, but due to data availability, this study will consider the above mentioned factors. The study uses a model of household consumption based on existing literature and provides empirical evidence substantiating the typology. The basic empirical issue focuses the function of life style patterns and socio-economic demographic determinants of the patterns of household consumption. Using a life style survey of adults in Tanzania, underlying life style patterns were recognized and put together with socioeconomic variables to discriminate among consumption groups. The study analyses revealed considerable differences along with those groups in their life styles and socioeconomic status.

Methodology
The rationale of this study is to investigate on how demographic factors determine household expenditure. This chapter therefore presents the method and techniques that have been adopted to conduct this study. The first section describes the data collection methods while the following section describes the data analysis techniques.

In this study the influences of demographic factors and income after tax on household consumption on education and health facilities were examined. Cross-section data were used to estimate the influences of demographic factors and income. The Household Budget Survey data are used in this study because they consist of market prices for all goods and services purchased by household to satisfy their needs and wants. Household expenditures include all expenditures on education and health facilities .The household final consumption expenditure is the largest constituent of final uses of GDP, representing in general around 60-% of GDP. It is therefore an essential variable for economic analysis of aggregate demand (OECD, n.d.). Data for this empirical analysis comes from the (2011-2012) Tanzania Household Budget survey. The data are made available by the Tanzanian National Bureau of Statistics. Income after tax is the yearly household income after tax, and is in million Tanzania Shillings. Household expenditure is the total household expenditure on education and health facilities per year. It is also in million Tanzania shillings.

The survey was carried out to get information for private households on economic activities, household income, expenditure, housing characteristics as well as asset ownership. The survey lasted for a period of one year and covered 10,400 randomly selected households in mainland Tanzania. This study used the Interview as they are analogous to diary and that the summary level expenditures in the Diary FMLD file are not as extensive as those in the interview FMLD file. To have as full information as possible for the households in the sample, households with erroneously reported amounts and those with missing data on certain consumption categories were excluded. That makes the total available observations to be 4311 (based on the requirements of this study). This study intended to see the impact of the mentioned factors on consumer expenditure. Due to data availability, the demographic variables used to explain the effect of demographic factors on family spending are as follows,

Education
The education of household head is classified as the years spent in school. It ranges between zero and sixteen years. When many years are spent in school the household head is then considered as educated and otherwise if fewer years are spent on schooling.

Family size
As per dataset, family size ranges from one person to fifteen people. It is expected that larger families will be likely to consume extra as compared to small families. Expenditure amounts might not linearly depend on the number of households members. For instance, ceteris paribus, the use of money to pay for school fees would provide an inverse relationship between family size and per capita expenditure on schooling. Thus, family size is used as description for "economies of scale" In families which may affect per capita expenditure within the family.

Household head's age
Household expenditure was expected to be influenced by the household head's age. For this particular data set, the householder's age ranges between sixteen and eighty seven. For this particular analysis, it is assumed that a person can start to be the head of the family from the age of sixteen, and the maximum age as per the data is eighty seven. It is expected that the household expenditure will be increasing as the household head age is getting higher, since the responsibilities will be increasing.

Sex
Sex of the family head is also considered to affect household expenditure. This means the expenditure pattern will depend on the sex of the household head.

The following model was used to study whether demographic factors and income after tax affect household expenditure:

$$hhexpend = \beta_0 + \beta_1 famsize + \beta_2 age + \beta_3 educ + \beta_4 female + \beta_5 fincatax + u$$

Where,
hhexpend is the total household expenditure on education and health facilities, *famsize* is the size of the family, *age* is the age of the household head, *educ* is the years spent on schooling by the household head, *female* is the dummy variable which is one if the family head is a female

and zero if otherwise and *fincatax* is the family income after tax, which is regarded as a control variable since it also affects the relationship of the variables under the study.

Estimation and Discussion

This chapter intends to empirically observe the impact of demographic factors on household expenditure, using the data available. The first part involves analyzing the effect of family size, age and family income after tax on household expenditure. Regression output will be discussed in the second part, and the last part will involve presentation and discussion of the results. The Eviews 9 software was used to analyze that impact. The variables household expenditure and family income after tax were normalized before running the regression.

Table 1: Descriptive statistics

	LHHEXPEND	FAMSIZE	AGE	EDUC	FEMALE	LFINCATAX
Mean	4674.302	2.481095	46.60636	13.28253	0.479007	27453.84
Median	4369.750	2.000000	47.00000	13.00000	0.000000	25635.62
Maximum	7560.64	12.00000	78.00000	16.00000	2.000000	36600.75
Minimum	1786.98	1.000000	16.00000	0.000000	0.000000	4392.08
Std. Dev.	1.821	1.493389	17.54995	1.843020	0.504700	1.93
Skewness	0.516710	0.355443	0.136640	-0.992643	0.143597	0.438872
Kurtosis	4.91638	6.096038	2.194749	8.988679	1.173949	6.51861
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	4311	4311	4311	4311	4311	4311

Note; Household expenditure and Family income after tax are both in million Tanzania Shillings. The variable Female represents sex, it is a dummy variable (it is one if the family head is female).

Results presentation and discussion

As per the available data, two models were estimated. The second model excluded the insignificant variables to see if the importance of the remaining variables will be affected in any way. The estimated results for the two estimated models are given by the table below;

Table 2: Estimation results for analysis

Dependent variable : lhhexpend		
Independent variables	1	2
famsize	0.067	0.076
	(7.69)***	(7.74)***
age	0.027	0.048
	(2.93)***	(2.86)***
educ	0.016	0.036
	(2.31)***	(2.25)***
female	-0.673	
	(-0.88)	
lfincatax	0.060	0.072
	(17.24)***	(19.17)***
Observations	4311	4311
R- squared	0.468	0.452

Notes: Figures in parentheses are t statistics. Asterisk (***), (**) indicates significance at 1 percent and 5 percent levels, respectively.

The equation for analysis is presented below in the usual form.

$$lhhexpend = 0.13 + 0.08 famsize + 0.05 age + 0.04\ educ + 0.07 lfincatax \qquad (1)$$

$$(3.53) \quad (7.74) \quad (2.86) \quad (2.25) \quad (19.17)$$

$$[3.52] \quad [7.64] \quad [2.46] \quad [2.25] \quad [19.14]$$

$$N = 4311, \quad R^2 = 45\%$$

Notes: The usual OLS standard errors are in parentheses, (), below the corresponding OLS estimate and heteroskedasticity-robust standard errors are in brackets, [ ].

Since the study used cross section data and, due to the fact that they have heteroskedasticity problem, the homoskedasticity assumption is needed to justify the usual t-tests, F tests and confidence interval. The white test was used to test for heteroskedasticity. All the variables are statistically significant using either set of the standard errors because the two sets of standard errors are not very different.

Discussion of the Results

Table 2 above gives the estimated results for the two different models. Since the first equation had one insignificant variable, which shows that for this particular sample, the sex of a household head has no effect on household expenditure. The following model (after dropping the female variable) is then used in the analysis. Among the demographic variables, size of the family, household head's age and the years spent in school by the household head are observed to highly influence household expenditures on education and health facilities. Hypothesis was to test whether the demographic factors has effect on household expenditures on education and health services when family income after tax is controlled for. The result shows that demographic factors significantly affect family expenditures on the services, specifically, a one more year of age of a household head is expected to increase the predicted household expenditure on the services by 5 million Tanzania shillings per year, ceteris paribus; while a one more member in the family is expected to increase the predicted household expenditure on the services by 8 million Tanzania shillings per year, ceteris paribus; and a one extra year spent in school by household head is expected to increase the household expenditures on education and health services by 4 million Tanzania shillings per year. For the control variable, the results are also as expected, that a one percent increase in the family income after tax is expected to increase the household expenditure on the services by 7 percent, yearly. The effect is statistically significant and also justifiable. The assumption is that, as the number of the family members increases, the expenditures of that particular family will tend to increase as well. Likewise, as the age of household head increases, we expect his/her responsibilities to also increase especially on health issues because of the ageing process which will in turn increase total household expenditure.

Conclusion and Recommendation

With the key goal of analyzing the impact of demographic factors and family income after tax on household expenditure, this study used cross section data to provide the evidence that support the preposition that size of the family, the number of years spent on schooling by the household head and household head's age matters in household spending patterns.

In this analysis, OLS regression technique was used with cross section data to investigate the impact of the demographic variables on household expenditure on health and education. The results proved that among the considered demographic factors, size of the family and the educational level positively and significantly affect household spending pattern. Likewise, age of the household head has also a positive and significant effect on household expenditure. For the dropped demographic variable female, which is a dummy variable indicating the sex of the household head does not have a greater impact on household expenditure pattern on education and health services, since it is insignificant. This is not expected to be the case if one item is consider consumed at a time. In his study of comparing the female and male-headed households, (Katapa, 2006) concluded that female-headed households were more likely to be small, living in rural areas and not have enough food to eat, which implied that female-headed households are poorer as compared to male-headed households. This brings a need to do more studies on the effect of demographic factors on household spending patterns, by considering particular commodities of interest, and include more demographic variables. This was beyond this study due to the time constraint.

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