SOCIO- ECONOMIC DETERMINANTS OF HOUSEHOLD SPENDING ON EDUCATION IN SUMBAWANGA MUNICIPALITY

SOCIO- ECONOMIC DETERMINANTS OF HOUSEHOLD SPENDING ON EDUCATION IN SUMBAWANGA MUNICIPALITY

By

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A Dissertation Submitted to the Faculty of Social Sciences in Partial Fulfillment of the Requirements for Award of the Degree of Master of Science in Economics of Mzumbe University

2016

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled **Socio economic Determinants of Household Spending on Education in Sumbawanga Municipality,** in partial fulfillment of the requirements for award of the degree of Master of Science in Economics of Mzumbe University.

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Signature

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DEAN, FACULTY OF SOCIAL SCIENCES

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I, Oscar Mpasa, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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Date_____

ACKNOWLEDGEMENTS

I would like to express the deepest gratitude to my supervisor Dr. Mursali A. Milanzi, lecturer in the Department of Economics at Mzumbe University for his excellent guidance, compassionate attitude, endurance and providing me with an excellent training for doing research. His mentorship was paramount in providing a well-formed experience reliable with my long-term career goals.

My acknowledgement is also extended to all MSc- Economics lecturers (Dr. R. Dimoso, Dr. J. K. Sesabo, Mr. B. Amri, and Dr. S. Mbano) who have devoted greater effort to guide me in my studies. I thank them for the knowledge and competence I acquired from them which has been useful to the rest of my life.

My special thanks go to my siblings, relatives and all staff members of Mazwi Secondary School in Sumbawanga, for their moral and financial support during the whole period of my study.

Finally, I would like to thank those who have assisted me in accomplishment of this study but their names do not appear above, I really appreciate their contributions. May God Almighty bless you all!

However, any deficiencies in this study are my sole responsibilities.

DEDICATION

I dedicate this dissertation to my loving family, my wife Beatrice Martin and children, Jacqueline, Mathias, Martin and Regina for their tolerance while I was away pursuing this study.

ABBREVIATIONS AND ACRONYMS

BLUE	Best Linear Unbiased Estimator
CSEE	Certificate of Secondary Education Examination
CLRM	Classical Linear Regression Model
ESDP	Education Sector Development Plan
ESA	Education Sector Analysis
HBS	Household Budget Survey
ICT	Information and Communication Technology
PEDP	Primary Education Development Plan
OLS	Ordinary Least Squares
OECD	Organisation for Economic Cooperation and Development
NFRA	National Food Reserve Agency
SEDP	Secondary Education Development Plan
UNESCO	United Nation Educational, Scientific and Cultural Organisation
URT	United Republic of Tanzania
UNHS	Uganda National Household Survey Report

ABSTRACT

Since independence, the government of Tanzania has pursued various strategies to develop the education sector and ensure access to education to its citizens. The 5th phase government recently adopted free education policy up to the secondary level for government schools. In this arrangement, fees and compulsory contributions have been abolished. However, the structural differences in education attainment still exist among children. This is mainly attributed to differing patterns of spending in other aspects of education expenditure. The present study is an attempt to systematically analyse the socio-economic determinants of education spending at the household level. The study identified social-economic determinants of education at four levels, namely household head specific characteristics, household specific characteristics, school specific characteristic and student specific characteristics.

A cross-sectional household survey was conducted to Sumbawanga Municipality randomly selected households. Three sets of regressions involving expenditure categories of non-fee, fee and total as the dependent variables of the study estimated. The OLS estimation technique was used for estimating the non-fee and total education expenditure equations whereas fee education expenditure equation was analysed using Tobit model. The main findings from this study show that income of the household, sex, marital status of the household head and location of the school within a district are the key factors determining the amount to be spent in education. However, the level of education and working status of the household head are positively significant determinant of both non-fee and total education expenditure. Ownership of durable assets in the household is significant determinant of amount to be spent on fee and total education expenditure. The number of students in the household is significant and positively correlated to total education expenditure.

Therefore, in attempt to improve education attainment, policy makers should target the majority of poor households. Finally, public and household expenditures complement each other. The improvement of public schools in habitants with well trained and motivated teachers will be an incentive for household to increase spending in education.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

STUDY BACKGROUND AND PROBLEM FORMULATION

1.1 Introduction

This chapter attempts to present the general concept, overview, trend and status of the variables under study. It also provides the coverage of the study in terms of geographical context within which the study was conducted (Kothari, 2004). Therefore, this chapter covered background of the study, statement of the research problem, purpose and significance of the study, organisation of dissertation and scope of the study.

1.2 Background of the Study

Education can be defined in many different ways according to the purpose and the educationalist concern. But all schools of thought concur on one thing, that education is human development and his or her interaction with environment. Farrant (1981) stated two ideas that implied in the word education. One is that of leading out new knowledge and experience, and the other is that of feeding and thereby growing and developing. Castle (1961) says education is what happens to us from the day we are born to the day we die. He concludes that education deals with the person, society things and ideas that deal with individuals, their social, physical and spiritual environment.

One can view education as both consumption and an investment good. Education could be seen as both consumption and an investment good in that it is valued for its own sake and because it provides future financial returns (Gentler & Glower, 1990). In support of Gentler and Glower (1990), Dimoso (2012) argued that consumption benefit of education is divided into three components: An investment component which results in an increase in an individual's measured wealth; a present consumption component such as the utility currently derived, say from attending

class; and a future component which results from the fact that education improves one's ability to consume other goods later in life.

Moreover, Kutty (2008) argued that education is accepted as investment good because is a means for obtaining an income with better education resulting in better and higher paying jobs. Parents educate their children so that their children and their children's children will have better life chances and because they enjoy having literate and educated children (Al-samarral & Tessa, 2012). Education and investment in human capital is one of the most important factors for economic development in any country especially in developing country like Tanzania. At a micro level education allows individuals to gain better skills and knowledge that enhance economic growth and at a macro level for many families investment in human capital is seen as the principle route out of poverty (Quang, 2006). Education plays a major role in the economy of any country, as it is a significant source of knowledge and skills which enhance creation of personal, social and economic wellbeing (UNESCO, 2009).Thus, any activity that increases the quality of labour may be thought of as human capital investment, such as formal education in Tanzania. Education has positive externalities as one educates oneself the nation at large also benefit. Basing on the Schumper's approach (1973), Olaniyam and Okemakunde (2008) argued that the government invests in education in order to make possible the creation of new ideas which would go a long way to bring technological progress for economic growth and development

Education system and development in Tanzania have evolved overtime, passing through different phases, each having different characteristics and emphasis. During pre colonial period (up to 1870s) the informal education system in Tanzania intended to create a good citizen of the clan or tribe. The instructors were elders and everyone else in the community (Omary, 2002). Formal education and literacy skills were introduced in 1860s and 1870s by foreign voluntary agencies mostly connected to missionaries. The first government school was opened in 1893 (Mushi, 2009).

Prior to independence, access to basic education in Tanzania was limited, with wide inequalities in terms of race, region and gender. Many primary and secondary schools had been established by Christian missionaries hence providing Christian favourable education access (Al- Samarral & Tessa, 1992). According to Cameroon and Dodd (1970) the enrollment of primary school children was under 10 percent where as that of secondary was below 1 percent with no female pupil who had ever progressed beyond the primary level education by the year 1947.

After independence, the government centralised education activities in the country to eliminate inequalities in the provision of education based on gender, religion and ethnicity (Mushi, 2009). The establishment of private secondary schools was not permitted though reluctantly and private primary school was not allowed (Cameroon a& Dodd, 1970). Moreover, agricultural based primary curriculum was introduced as a result of Arusha Declaration in 1967 with a policy of education for self reliance. The changes in education system curriculum aimed at producing skilled manpower for the social and economic sectors of the post independent country (Mushi, 2009). Arusha Declaration emphasised on the need for mobilising human resource for self reliant development rather than relying on capital or material resource. The three pre requisites of development identified were land, good policies and good leadership (Galabawa, 1994). Universal Primary education (UPE) was part and parcel of the social economic transformation of education for self-reliance (Knight & Sabot, 1990). The organisation and implementation of UPE were channeled through central development plans so as to expand gradually to achieve UPE goals by 1989 (Mushi, 2009). The implementation of UPE started by abolishment of school fees at primary level in 1973 (Mushi, 2009). Due to deficiencies which were marked in the implementation of policy for self reliance especially in post secondary school level, Musoma resolution was formulated in 1974 (Galabawa, 1994). It was resolved that secondary school graduates should serve one year in the national service and post secondary instution was declared open for adult workers and peasants who satisfied the minimum entry qualification (Biswalo, 1985). Female students were allowed to

enter the university directly from secondary schools and were exempted from two years compulsory work period (Kapinga & Dunrong, 2010).

Tanzania introduced new education Act in 1978 which made primary enrolment and attendance between the ages of seven to thirteen compulsory. The Act permitted the enforcement authorities to penalise parents who failed to send their children to school. Some parents were fined or even imprisoned for not sending their children to school (Mushi, 2009). The number of enrolment increased by four fold during the 1970s and continued to rise until 1983 (Knight & Sabot, 1990).

Tanzania implemented the socialism policy for about two decades. According to Project Performance Assessment Report (2010), by the early 1980s, external shocks (oil crises, low coffee prices, draught and war with Uganda) and deficient economy policy caused an economic crisis that needed to be resolved through economic restructuring and recovery. In efforts to address the economic crisis the government turned towards free market policies adopting a Structural Adjustment Programme which includes major currency devaluation, the curtailment of government expenditure, civil service retrenchment and extensive privatisation (Al- Samarral & Tessa, 1992). The education sector faced massive fall in resources that led to setback of progress made towards UPE during the 1970s and declining quantity and quality at all levels of education. Tanzania went through significant economic changes. The economy changed from state controlled to market oriented and the political system from a one party state to multiparty democracy (Sumra, 1993). In line with these economic changes the education sector began to encourage a private sector involvement in education sector (Al- Samarral &Tessa, 1992).

In finding the alternative of supporting public schools, the government adopted the cost sharing policy and school fees being re-introduced in 1984 (Mushi, 2009). Johnstone (2006) defines cost sharing as the shift in the burden of education costs from being borne predominantly by the government or the taxpayer to being shared with parents/students and the government. Under cost sharing policy students and their parents are required to pay fees, accommodation, caution money, examination

fees, practical training as well as books and stationary (Omary, 2002). These trends increased the completion in the demand for, and supply of goods and services which in turn influenced the form and direction of formal and non formal education in the country (Mushi, 2009). Regulations imposed in education sector encouraged private sector involvement and sought a broader resource base for financing education.

In 1992, the government repealed section 30 of the 1978 Education Act so as to allow private primary schools to operate (Galabawa, 1994). By repealing this section education was considered as an enterprise to whose cost were driven by market forces of demand and supply (Sumra, 1993). People began to invest in school as they would invest in any other commercial activity. According to Mushi (2009), education provided by private investors is costly, certainly forbidding the majority of Tanzanian to access. By the mid 1990s households faced rising cost at primary and secondary levels. As a result, low enrolments and high dropout characterised the primary education system (Mushi, 2009).

Tanzania introduced the Primary Education Development Plan (PEDP) in 2002 aiming at expanding school access, improving the education quality and to increase school retention at the primary level (Makumba, 2014). The plan covered the period between 2002 and 2006 and was developed within the context of the Education Sector Development Plan (ESDP). Under the PEDP, primary school fees and parental contribution were abolished and Capitation and Development grants for direct disbursement to primary schools were introduced (Mbele & Katabaro, 2003). In 2004, the government embarked on an ambitious plan for the expansion of secondary system through Secondary Education Development Programme (SEDP). To achieve the goals of both plans, the government committed to financially help public schools run themselves to quality performance by providing Capitation grants. The commitment was to the tune of Tsh.10, 000/= per primary school pupil and Tsh.25,000/= per secondary school student per year.

The grants aimed to facilitate the purchase of books, learning and teaching materials, constructions and renovation and supporting school administration (Makumba, 2014). However, the disbursement of capitation grant is still a challenge. A survey conducted by HakiElimu (2014) during the fiscal year 2013/14 shows that, the amount which the surveyed school received per pupil (primary school level) was about Tsh.2, 700/= instead of Ths.10, 000/=. Similarly, secondary schools received Tsh.11, 462/= per student instead of Tsh. 25,000/=. The rest of the costs are still covered by households.

Funds that finance the education sector in Tanzania comes from four main sources, government domestic resources, general budget support, project support and other stakeholders including parents, non-state actors and private sectors (ESA-2012). According to the education sector analysis (ESA-2012) for Tanzania mainland, households contribute about 32.1 % of public education expenditure. This raises concern as to whether poorest households would be able to meet the costs of sending their children to schools.

Both public and households investment in education are highly considerable not only because of their magnitudes but also because of their nature and characteristics. The two are mutually dependent so that in the absence of either of them there is a possibility of underfunding of the education sector. Family expenditure complement or substitute the public efforts (Tilak, 2002), and hence influencing one another in the positive way (Tilak, 1991). The higher the government expenditure, the higher would be the expenditure of household on education and vice versa. In similar vein, countries that invest less in education, there is a high incidence of heavy costs of education being incurred by parents (Mehrotra & Delaminica, 1998). To ensure the utilisation of educational facilities, quality and other institutional measures provided by the public, the investment of households in education is essential, while public investment can provide educational facilities, only household investment will enable its utilisation (Tilak, 1991).

Since the system of education in Tanzania has undergone a massive transformation in secondary schools, understanding household expenditure on education is imperative.

1.3 Statement of the Problem

The government and other stakeholders are the most responsible for provision of quality education for sustainable development. Understanding the social economic determinants of households spending on education is of great importance in policy formulation and educational planning policies (Shafiq, 2011). For example, the incorrect assumption leads to formulation of unsound policies on fees, scholarship and subsidies (Rojas, 2014). Therefore, accurate and sufficient information generated from empirical studies and theories are required for understanding of the phenomenon.

The human capital theory postulates that an individual's decision to invest in education is based upon an assessment of the net present value of the costs and benefit of such an investment (Becker, 1964). If rates of return to education are perceived to be high, households may choose to forgo present consumption and invest in education in order to increase the earning capacity and other benefits in future. In the household production function approach it is assumed that a combined household utility function is maximised and resource allocation decisions are made through the compassionate dictatorship of the household head (Becker, 1995). Furthermore, it is argued that the attributes of the household members also determine the allocation of household resources in education. For example, the stronger the bargaining powers of a family member the more influence they will have on resource allocation decisions (Maasterson, 2012). This implies that educational attainment is related to other household characteristic such as household income and the level of parental education

A number of studies have been conducted to investigate the socio- economic determinants of household spending in education. For instance, Maasterson (2012) show the existence of gender differences in education spending in Uruguay. Hence, sex of a child could be an important determinant on household spending in education. However, Omori (2010) concluded that ability of children in studies rather than gender is what matters in decision to invest in education in the USA. In Cyprus, Andreous (2012) shows that households whose heads completed tertiary education had higher education expenditure than those with lower education. Dimoso (2012) confirmed that mother's education level had a significant influence on the education attainment of the school children regardless of their gender in Tanzania. Owens and Nerman (2011) suggested that occupation is less important in predicting demand for education after the push of Tanzania's government for Universal Primary education (UPE). Ngwilizi (2013) confirmed that household age plays a significant role in education spending in urban Tanzania. The foregoing review shows that there are numerous determinants of education spending varying from student to household level characteristics.

However, there has not been a common conclusion as regard the kinds of social-economic determinant of household's expenditure on education across countries. This seems to suggest that contextual characteristics for instance culture and traditions within a country determine the relative importance of the determinants. Furthermore, despite various interventions in education sector since independence evidence shows the pattern of spending at the household level varies. For instance, despite the increase in school enrolment after introduction of UPE, structural difference in education attainments has remained over the period. Less privileged children still receive less education than better off children in Tanzania (Owens & Nerman, 2011). Therefore, there is a need for accurate information on what brings the difference in expenditure pattern in order to formulate a sound education policy for planning purposes.

Therefore, the study was set out to investigate and provide empirical evidence on what determines the household expenditure on education by using Sumbawanga Municipality as the case.

1.4 Objectives of the Study

1.4.1 General Objective

The study aimed at assessing the socio-economic determinants of the household's spending in education

1.4.2 Specific Objectives

i. To determine what kinds of characteristics of the household and household head affect the level household spending in education.
ii. To determine what kinds of school characteristics affect the level of household spending in education.
iii. To determine what kinds of children's characteristics significantly influence the level of household spending in education.

1.5 Significance of the Study

According to ESA (2012), important disparities in access of education exist according to gender and area of residence, and they increase with successive levels of education, but the most discriminatory factor in schooling pattern is families' level of income. It indicates also that household contribution to education is significant. The determinants of demand for education have received little attention in the literature in Tanzania. There are challenges in assisting households with educational expenditure on many developing countries facing resource constraints because of targeting households that do not require assistance or not targeting households that do require assistance (Shafiq, 2011). Therefore, findings will be useful in attainment of results that can have policy implication for a wide range of education issues regarding the efficiency and equity in Tanzania as among the developing countries.

It will be helpful to policy makers in determining the criteria to be used in assisting households with educational expenditures and hence helping to improve the education quality particularly for public schools. Identifying household's constraints to investment in education will help to recognise how education policy should be focalised. Hence, the study on the household's determinants of expenditure on education of Tanzania is of great significant in revising policy and priorities of resources towards programs to improve educational attainment among households.

1.6 Organisation of Dissertation

The dissertation consists of six chapters. Chapter One is an introduction which includes background of the study, statement of the problem, objectives of the study, significance of the study and scope of the study. Chapter Two comprises Definition of key concepts, theoretical and empirical review of literatures. Chapter Three presents methodology used in the study which further includes research design, data and data sources, general econometric model and estimation technique as well as description of the variables. Chapter four presents the findings of the study, Chapter five presents the discussion of the findings and finally Chapter Six which is made up of summary of findings, conclusion and policy implications.

1.7 Scope of the Study

The study covered Rukwa region specifically in urban areas of Sumbawanga Municipality. The data was collected in 8 wards which have high population of household with children in secondary schools with many ward secondary schools.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The literature review examines the empirical studies that have been undertaken by different researchers and theoretical orientation on the factors that determine household expenditure on education. Theoretical review provides description and summary of different theories explaining the relationship between the variables under study. Empirical literature review presents the description and summary of the earlier studies connected to the problem, comparison and conceptualisation of the current study in relation to the earlier studies (Kothari, 2004).

2.1 Review of Theoretical Framework

This part presents definition of key concepts which appears mostly in the study. Moreover, it explores different theories which provide a general base in explaining the relationship between the variables under study. It is intended to gather general or theoretical knowledge about the phenomena (Msabila& Nalaila, 2013).

2.1.1 Definition of key Concepts

2.1.1.1 Education expenditure

Education expenditure refers to payment of cash or cash equivalent for educational goods and services. This includes uniforms, fees, transport, hostel, private tuition, books, stationery and other contributions (Tilak, 2002).

2.1.1.2 Household

Ellis (1998) defined household as a social unit, characterised by the sharing of the same dwelling house, with income that are pooled together for common use. For this study, household is defined as a social unit which consists of one or more people

who live in the same house with a single head. Their income is pooled together for food, shelter and other social needs including education.

2.1.1.3 Household Head

Household head is defined as the one who manages the income earned and an expense incurred in education by the household, and is considered by other members of the household as the head. The household head could be either the male or female and is not necessarily the oldest person in the household. He or She is responsible for all household activities and takes the decision in all household related matters (UNHSR, 2009/2010)

2.1.1.4 Household's Head Characteristics

Refers to social-demographic characters of the households head like ages, sex, marital status, level of education, occupation and employment status (Takwa , 2005)

2.1.1.5 Household's Characteristics

It is the general term including details of a household such as the level of income, assets owned, tribe, religion, number of household members, household composition and household dependants (Kayastha, 2002)

2.1.1.6 Child Characteristics

Refers to sex of a child, position in the family and ability in learning within the household (Tilak, 2002).

2.1.1.7 School Characteristics

Refers to location of the school, existence of incentive scheme in school such as provision of mid day meals, pupils teacher ratio and type of institution whether it is government or private school (Tilak, 2002)

2.1.2 Theories underlying the study

This part presents the theories which the researcher used in the study. The study employed two theories, namely Human Capital Theory and Household Production function theory. These theories provide the bases for understanding of the relationship among the variables under investigation.

2.1.2.1 Human Capital Theory

Human capital theory roots from Smith's (1776) ideas of labour economics. Smith argued that the main cause of the prosperity of the nation is increased division of labour. The division of labour is the only factor in economic growth since it increases the productivity through specialisation of tasks. It shows the relationship between the wage rate and undesirable attributes of a particular job. According to Smith (1776) training (not natural ability) is the key to understanding wage differentials. Invention is the result of worker's intelligence. Moreover, he commented that a man educated at the expense of much labour and time may be compared to one of those expensive machines and the work he learns to perform should recover all the expenses incurred in his education (Olaniyn & Okemakinde, 2008). Therefore, there is tangible connection between education and its impact on the ability of earning higher wages. Acquired capacities were classified as capital. Schultz (1961) and Becker (1964) stated that time and money spent on education builds human capital hence one should be able to estimate the rate of returns on such investment in a way similar to investment in physical capital (Olaniyn & Okemakinde, 2008). They outlined the relationship between labour generated income (earning function) and human capital, the latter being measured through the number of years of schooling and degree of professional experience. Therefore, a measurable human capital is regarded as a factor necessary for production and national wealth. Schultz (1961) identified people as the source of the economic growth. He considers all human abilities to be either innate or acquired. He argued that every person is born with a particular set of genes which determine his innate ability.

According to Schultz (1961), knowledge and skills is in great part the product of investment and when combined with other human investment, accounts for technical advancement of countries. Attributes of acquired population quality which are valuable and can be improved by appropriate investment are treated as human capital. Therefore, human capital is viewed as the capacity to adapt. He asserted that labourers are capitalist through the acquisition of knowledge and skills that have economic value, acting in their own best interest (Almendarez, 2011). Schultz demonstrated that social rate of return on investment in human capital is larger than that based on physical capital such as new plant and machinery (Olaniyn & Okemakinde, 2008).

Therefore, human beings themselves are capital. Becker (1964) postulated that human capital theory formally excludes the relevance of class and class conflicts which thereby imposes limitations on an individual capability to function within the market. Discrimination reduces the real income of those that discriminate as well as those of the minority. Becker regards all human behaviours to be based on economic self interest of individual operating within freely competitive market. He developed a systematic framework for studying the return on education, on job training and wage differentials and wage profiles overtime.

OECD (2004) defines human capital as knowledge, skills, competences and attributes embodied in individual and facilitates the creation of personal, social and economic well being. It assumes the economy under the perfect capital market that denotes free entry to the market. Labour market is homogeneous that one can work everywhere providing that he/she is professionally educated (Goulder, 1993). Furthermore, it is assumed that the significance of education and training is the key to successful participation in the worldwide economy. Education improves productivity and thus could explain higher wages and hence duration of education and training increases income of an individual. The Human Capital theory suggests that education or training raises the productivity of workers by imparting useful knowledge and skills, hence raising workers' future income by increasing their life

time earnings (Almendarez, 2011). Therefore, expenditure on education should be considered an investment since it is undertaken with the view of increasing personal income.

According to human capital theory, an individual decision to invest in education is based upon the assessment of the net present value of the costs and benefit of such investment. The parental decision to invest in children human capital is motivated by the return that will accrue not only to children but also portion of return that will generate transfers to parents in the future (Rosen, 1987). Al-samarrai and Tessa (1992) in supporting human capital theory they insisted that parents invest in their children education to ensure that their off spring will be best placed to support them in the later life. Therefore, spending on education is not wastage but the creation of wealth.

The theory was helpful in identifying the expectations of households in investing in education. Under human capital theory decision regarding to investment in education is based on efficiency consideration that is to increase the level of cognitive stock to enhance economic productivity and hence raising the standard of living. The theory does not consider other factors that determine the level of household spending among children such as equity between children, prejudices and biases. The Household production function Model was employed to fill the gap.

2.1.2.2 Household Production Function Theory

The household production function is a collective household model developed by Behrman, Pollack and Taubman (1982). It is the framework in which a family unit is hypothesised to use inputs for the production of education for children in the family (Kutty 2008). According to Kutty (2008), in household production function model, household are viewed as producing educational, cognitive and socio-emotional outcomes for their children by application of particular inputs. These inputs include; schools, educational materials, extra-school tutoring, housing, neighborhood environment, parent's time and supervision and other cognitive stimulation.

The model assumed that household's decision is best analysed by using household utility model. Household will buy goods or services as long as they increase their general level of utility. Individuals are assumed to engage in bargaining process that result in Pareto efficiency intra- household allocation (Pollak, 2002). Moreover, household production function approach assumes that the household acts as one decision making unit when it comes to decision on consumption and production. The assumption is that household generates utility from consumption of commodities and each household utility function comprises utility of each member of the household (Pollack, 2002). The distribution of power within the household is an important factor in determining household allocation of resources.

A combined household utility function is maximised and resource allocation decisions are made through the compassionate dictatorship of the household head (Becker, 1995). Sen (1990) argued that bargaining power on schooling decision in the household is dependent to individuals' characteristic.

Therefore, it is the attributes of other household members as well as the household heads that determine the allocation of resources in education. For example, if the mother is educated is likely to improve her bargaining power within the household and her preference for educated children will play a larger role in the decision to send her children to school (Al-Samarral & Tessa,1992).

Household production function approach implies that there is an optimal investment in education for each child equating the present value of the expected marginal cost and benefit of the household (Dimoso, 2012). Costs are incurred throughout the direction of a child's schooling. This includes direct costs (for example fees and contributions) and opportunity cost of a child's time (for example household work forgone while at school). Benefit to the households from education will depend on the amount of remittances the family are expecting from their children once they have left home, the probability that their children will get work, the way individual child can translate education into improved productivity and the time preferences of the household (Dimoso,2012).

Household will spend in education as long as they increase their general utility level. Parents consider whether the utility of taking the child to school exceeds the utility of keeping the child at home, then parents enroll their child in school and vice versa (Gertler & Glewwer, 1990). Under household production function, household education expenditure is directed to specific goods or services to satisfy needs for good education. Although the optimal level of the investment in education is determined by each household, the presence of costs implies that the optimum amount of education may be unattainable (Dimoso, 2012).

The household maximises utility which is derived from his/her own education and from consumption of other goods given the budget constraints (Braconi, 2001). Utility is determined by household preference and taste, which are determined by demographic and socio-economic factors. Education is a durable capital stock and is demanded both as consumption good and an investment good.

How much household can afford depends on its income, price and individuals socio economic characteristics such as age, education, occupation and geographical environment (Kutty, 2008). A collective household model was useful in identifying how household choose education provider and quality that maximises household utility given the household level of resources. It gives an insight into analysing household behaviour collectively with well-defined objectives.

Consumer as investor in their human capital produces investment with inputs of their resources. Thus, some of the outputs of household production directly enter the utility function, while other output determines earning or wealth in a life cycle context. Education on other hand does both (Grossmas, 2000). Human capital theory identifies the expectations of households in investing in education. Household production function model is helpful in analysing household behaviour to identify their determinants towards educational expenditure. In the human capital model, decisions regarding investment in education are made mainly on the basis of efficiency consideration. In the household production function model there are other considerations including equity between children, prejudices and biases

(Tilak, 2002). The household production function model of consumer behaviour was employed to account for the gap between education as an output and education expenditure as one of many inputs into its production.

2.2 Review of Empirical Studies

There have been numerous studies on determinants of household expenditure on education in many empirical studies of different countries. But the findings of these studies differ.

Tilak (2002) study the determinants of household expenditure on rural India by using NCAER survey data on Human development in rural India (HDI) which was supplemented by other sources. The study examined the extent of the household expenditure on education by different groups of population, the elasticity of the household expenditure on education to changes in household income on the one hand and government expenditure on education on the other and the determinants of family expenditure on education.

Gender is believed to be a very significant determinant of household expenditures on education. OLS estimators of the study show that there is no gender difference in education expenditure. Household characteristics particularly household income and the educational level of the head of the household found to be important determinant of expenditure on education. Moreover, the results show that household expenditure is highly elastic to household income levels. Through this study it is also seen that the education level of the head of the family is the important determinant of expenditure of education among the household. The coefficient is statistically significant at the 1 percent level of confidence that household whose heads have higher education level spend more in education. Moreover, the results show that the number of children is statistically significant with a positive sign. An increase in the number of children was found to increase expenditure on education though the average number of children among household was 2.68. The regression shows that school availability within the habitation is statistically significant at 1 percent level

for public schools but does not affect expenditure on private schools. Coefficients of elasticity clearly show that government expenditures and household expenditures do not substitute each other, instead they complement each other.

Tansel (2002) examined the determinant of education attainment of boys and girls in Turkey at the primary, middle and high school levels. Individual household factors such as household income, parental education and occupation were considered. The results of the study show that schooling attainment has a strong relationship with household income thereby implying that schooling is the normal good. Furthermore, the findings reveal that households are resource constrained in that higher income lead to higher schooling attainment. However, the effect of income on the schooling attainment of girls was larger than that of boys. Moreover, parental education was found to be strongly related to schooling attainment for both of them though the effects were larger on girls than boys.

Sulaiman, Ismail and Othman (2012) examined the determinant of expenditure on education by using the OLS model using the data from a household survey in Malaysia. In the study, the determinant of demand for education includes characteristics of parents or households background such as parent's income and education level of parents and the information of indicators for education expenditure due to impact of globalisation were employed. The study shows that household income is significantly and positively related to expenditure on education. It was concluded that as household income increases by 1 percent education expenditure also increased by approximately 1 percent indicating that the demand for education is unitary elasticity that is neither a necessity nor a luxury item in the consumer's budget. Education expenditure increases at a decreasing rate. The age and age squared of the head of the household are both statistically significant at the 1 percent level of significant with positive and negative sign respectively. This implies that the education expenditure increases with the age of the head of household at a decreasing rate that is the household with younger heads have smaller probability of education spending.

The study shows that education expenditure is likely to peak around middle ages when the head of the household is likely to have higher school grade level children. Moreover, the years of education of the head of household and mother are statistically not significant. The study indicates that the level of education among household heads correlated positively but is not significant while the years of education of mothers are negatively correlated with education expenditure. This implies that the households with lower education level are more concerned with their children's education which leads them to spending more on their education. Parental awareness of globalisation was found to be significant with positive sign at 1 percent level of significance implying that expenditure on education increases with the increase in the parental awareness of the impact of globalisation.

Quang (2012) using the Vietnamese Household Living Standards Survey from 2006 (VHLSS 2006), investigates the factors affecting household expenditure on children's education in Vietnam using the Tobit model. The main findings from this study show that household income has significant effects on the total amount of educational expenditure. In most cases, increase in the income of the household is always associated with an increase in educational expenditure. Households where the household heads have a higher level of education or with professional jobs enhance the probabilities of educational expenditure and lastly households with more primary school age or secondary school age children spend more on education, while households with preschool age or college age children spend less on education. These results show that families with more resources and better human capital are those who are able to spend more resources on their children's education.
Duong (2004) conducted a survey of 360 households of six villages in the Me Linh district, Vinh Phuc province in Vietnam. Using the logistic regression model, the study found that parent's education levels and the interaction between parents and their children are significantly increasing the school enrolment of children. Moreover, the finding reveals that family social capital, financial and human capital, added significantly to children's education attainment.

Choudhury (2011) examined the pattern and determinant of household expenditure on engineering education in Delhi-India. The data was collected from a student survey from final year students pursuing IT courses in the academic year 2008-2009. The patterns of household expenditure by different socio- economic and institutional characteristics of the students were analysed. By using OLS technique determinant of household expenditure was analysed. The findings reveal that, larger expenditure on engineering education is not because of high tuition and other fees charged by institution. The expenditure was due to higher expenditure incurred on non-fee and additional heads of expenditure. Hence, the pattern of household expenditure on education does not confirm the general perception that a significant portion of the household expenditure goes towards fees.

Kambhampati (2008) analysed whether the amount household spend on education depends upon the return to education widespread in the region in which they live. The data used for analysis was obtained from the 52nd round of the National Sample Survey (NSS) of India undertaken in 1995-6. Rates of return to education were estimated separately for boys and girls in 33 states in India. These rates of return were then included in education expenditure model. The results reveal that the rate of return in education was highly significant in increasing the amount spent on education by household both for boys and girls. However, the study findings show that the impact of variable is much larger at secondary level and for girls.

Donkoh and Amikuzuno (2011) used a logit model to find out the socio economic determinants of a household's probability of spending on education. The data used was the 2006/2007 Ghana Living Standards Survey Round Five (GLSS-V). The main objective of this study was to find out the factors influencing household spending on education.

A logit model was estimated with the dependent variable being the probability of incurring education expenditure. The essence was not to explain the determinants of education expenditure but to know which sections of the Ghanaian populace have a greater likelihood to spend on education, so that such people could be targeted for

support. The study found two categories of households with greater probability of spending on education. The first category consists of households whose heads are relatively young and those whose heads have formal education as well as ownership of land, bus and other durable assets. The second category includes female headed households, households with greater number of children of school going age; rural households and households living farther away from the nation's capital.

Awudu and Ogundari (2014) analysed the determinants of household's education and Healthcare spending in Nigeria. The study employed household level data to examine expenditure pattern for rural and urban household by using a double-hurdle model. The empirical results show that a household decision to whether to spend and how much to spend on educational and health care services are positively and significantly related to household income, household size and the level of education of the household head. Moreover, the findings suggest that, female-headed household tend to spend more on education of household members and healthcare services compared to male-headed household

Mariara and Kirii (2006) investigated the determinants of demand for schooling in Kenya. Probit and ordered probit regression methods were used to model enrollment and attainment respectively among regions by using child and household characteristics, household welfare indicators and community variable. The study findings show that household characteristics, quality and cost of schooling are important determinants of demand for education services in Kenya. Also, the results show that there are regional and gender differences in responsiveness of demand for schooling. Demand in rural areas is more responsive to policy changes than in urban areas, while girls are more affected by policy changes than boys.

Andreous (2012) investigated household expenditure on education in Cyprus. Heckman model was applied to analyse the data from the family expenditure survey of 1996/7, 2002/3 and 2008/9. In empirical analysis the study found the most profound factors affecting the level of expenditure are income, number of children in the household, region of residence and head's age and education.

The level of education expenditure increases with income and household size. But the study reveals that education and age of head appears to diminish over time.

Al- Samarra and Tessa (1992) used a logit model to analyse household survey data collected in rural Tanzania in 1992 with the aim of assessing educational attainments and education characteristics. The study focuses on how information collected on household and individual characteristics affect whether or not a child goes to primary school, completes primary and attends secondary. The study shows that when looking at the decision as to whether to enroll in primary school, father's education has a greater influence on boys whereas mother's primary education has a greater influence on girls. Furthermore, married mother's education can increase the probability of girls enrolling in secondary school by 9.7 per cent for primary education and a further 17.6 per cent for secondary, while having no significant effect on the enrolment of boys.

These results imply that mothers have a relatively stronger preference for their daughters' education and that their education affords them either increased household decision-making power or increased economic status.

Owen and Nerman (2011) using data from two nationally representative household budget survey data covering mainland Tanzania in 2001 and 2007, investigated the determinant of demand for education in Tanzania. The data was used to test whether the determinant of demand for education have changed during the Tanzanian government's push for Universal Primary education (UPE) in 2000's. Drawing on existing theoretical and empirical literature, three main hypotheses regarding education demand in Tanzania were tested. Whether demand for education is driven by cost of education, by the benefit of education, measured as the observed financial returns to education in the economic context of household and by preference for education. The study found that despite the increase in enrolment as the result of abolition of school fees, yet costs seem to be of limited economic significant and important structural difference in schooling remain. Less advantaged children still receive less education than better off children.

The study also found that occupation is less important in predicting demand for education. Being a wage earner or having an own business were large and significant determinants of demand for education in 2001 but these factors were significantly less in 2007.

Dimoso (2012) used ordered probit estimation techniques to assess whether school attendance and progress of children in rural primary school with respect to their gender is inversely affected by deteriorating environmental resource in rural south Pare highlands in Tanzania. Using cross-sectional primary data obtained in 2006/7, the study shows that the mother's literacy level had a positive and significant effect on the education attainment of the school children regardless of their gender. While the mother's secondary education significantly increase the probability of both the girls and boys progress at school, the basic literacy of the mother at the primary education level significantly increased the education attainment of the boys only. Also, the study shows that father's literacy had no effect on either boys or girls. According to this study mother's education has a strong influence on the education of the children

Ngwilizi (2013), using a sample from the 2010/2011 Tanzania National Panel survey Data to investigate socio economic determinants of household education expenditure on Tanzania. A model used underlies a typical earning function on which household education expenditure was regressed to its determinants. The result from the study revealed that, a size of household, income of household, education of household head, school-age children and number of children were major determinant of household to invest in Human capital. However, in urban household, the age of the household head plays a significant role, whereas the household head to be male or female was found to be unimportant factor. On the rural household, although age of household head is significant determinant of education spending, the research findings show that the contribution is minimal even on young household head.

2.2.1 Summary of Literature and Study Positioning.

Based on the reviewed literature, income of the households, education level of parents and household size are considered most as important determinants of household's expenditure on education. Some variables are uncommon and are considered by few researchers; for instance globalisation, distance of households from national capital, the ability of the student in class, assets ownership of the family and location of the school. However, the result from the reviewed literature shows that the significance of socio-demographic variables is uncertain. Some studies confirmed the significant effect of social-demographic variables to household spending in education; for instance, Tansel (2002), Kambhampati (2008) and Awudu and Ogundari (2014). Nevertheless, Choudhury (2011), Owen and Nerman (2011), Sulaiman, Ismail and Othman (2013) and Ngwilizi (2013) argued on the insignificance of some variables. The inconsistency of the findings is due to the fact that studies differ in geographical context; some studies were conducted in urban areas while others in rural areas which differ in terms of economic development. Types of data used in studies also differ; some used primary data while others used secondary data. The types of study design used are also different. Some used the cross-sectional study design while others used the longitudinal design.

Furthermore, econometric techniques used in their investigation are not the same. For instance, most of the studies used OLS, Logit model, Probit model and Tobit model. However, most of the studies were conducted in other countries such as India, Malaysia, Vietnam and Nigeria and Ghana. They cannot used to generalise the determinants of household expenditure on Tanzania due to economic and cultural differences. For studies which have been undertaken in Tanzania still the results are inconsistency. For instance, Dimoso (2012) revealed that mother's education level had a positive and significant effect on education spending to children regardless of their gender.

However, Al-Samarra and Tess (1992) revealed significant impact of father's education to the educational spending of a boy and mother's education to the education spending of a girl.

Since education is durable capital stock and is demanded both as consumption good and investment good, the study was designed based on utility maximisation model to analyse the determinants of household education expenditure. The theoretical framework is underpinned from household production function since it views household as both a production and consumption unit. This helped to model education as a commodity like any other commodity in the market. The theoretical determinant of the household education expenditure included socio-demographic factors and economic factors.

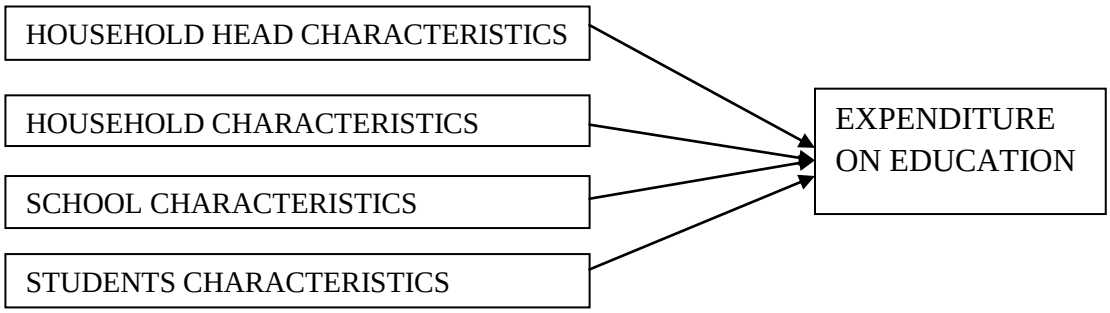
Socio-demographic factors determine consumer consumption pattern. Changes in socio-demographic variables can cause shift in demand structure (Kutty, 2008). The socio-demographic factors include level of education, sex, age, household size, marital status and type of the school while economic factors include household income, assets, employment and occupation. So, the determinant of household education expenditure was analysed by using the utility maximisation approach where allocation of consumer's expenditure is assumed to be compatible with consumer's behaviour according to well defined preferences.

Basing on theoretical and empirical literature review analysed, variables were divided into four groups which include children characteristics, household head characteristics, school characteristics and household characteristics as the determinant factors of household expenditure on education in Tanzania. From each group the study determined the factors which are significant and the comparison was made among results to determine the general determinants of household expenditure. This makes the process of implementing the policy much easier by targeting a particular group of variable in giving the general support to household. Furthermore, it increases awareness of what groups of those factors contribute mostly as the determinant of education expenditure among the households.

2.3 Conceptual Framework

The study pursued a statistical analysis for determinants of household expenditure on education in Tanzania with reference to Sumbawanga municipal council. However, educational expenditure can be determined through multiple ways, the study concentrated on household characteristics, household head characteristics, school characteristics and student's characteristics.

Figure 2.1 Conceptual Model of the Study



Source: Researcher's Own Design (2016)

2.3.1 Household's Head Characteristics and Education Expenditure

Refers to social- demographic characters of the households head like ages, sex, marital status, level of education, occupation and employment status. According to Takwa (2005), these characteristics have an important bearing on living conditions of household members, household size, child upbringing, the consumption of goods and services and the occurrence of demographic phenomena such as marriage, death and migration.

According to Shipler (2004), parents with low education may not be well engaged in their children's school activities because of their own negative school experience. Hence, they are expected to spend little in education of their children. Parents with high education are likely to better understand the norms and expectations of educational system that they can impart to their children (Laureau, 2003).

High education level by household increase awareness on the importance of investing in education and accordingly spends more on it (Choudhury, 2011). Households who are better educated, with professional occupation may spend more on education for their education and have a greater appreciation for children's education. Therefore, parents with higher level of education who have seen the benefit of higher education are more likely to emphasise on the importance of education to their children and are more likely to serve as good modes for their children (Kutty, 2008). Basing on earlier empirical studies, it is expected that education level of the household head and occupation of the household head are significant determinants of the household expenditure on education.

Hypothesis 1a: Household headed by higher educated head spends more in education than household headed by lower educated head.

Age of the household head has a significant effect on household spending. For instance, small households are normally associated with young household heads (Takwa, 2005). Hence, young household heads are expected to spend more in education than older household heads.

Hypothesis 1b: Younger household head spends more in education than older household heads

Majority of household heads working in public sector are salaried employees. Most of them are well educated with professional qualifications. Hence, they have higher financial benefit as compared to those who work in private sectors. According to Smits, Rani and Huisman (2010), household heads that are wage earners invest more in education. Therefore, household heads working in public sector are expected to spend more than those working in private sectors.

Hypothesis 1c: Household heads who work in public sector spend more in education than household head who work in private sector in the area

Marital status determines whether a person should become a household head or not. Majority of married household are headed by males. Women who lose the husband as a result of death, divorce or separation may turn into household heads, the position which they did not hold formerly. Usually, men do not lose their status of household head as a result of change of marital status. Child care and housing costs utilise a great percentage of household income. Married household heads are expected to share household expenses. Moreover, households headed by married couples can earn more income from both parents as compared to single household head. Therefore, it is expected that household headed by married couples invest more in education.

Hypothesis 1d: Household headed by a married heads spends more in education than the household headed by single head.

Moreover, the statistics show that after divorce, on average, a man is left with more assets than woman in developing countries (World Development Report, 2012). Assets contribute to the increase of more wealth in the household headed by male. Furthermore, the report shows that women are more likely to engage in low productive activities than men counterparts. Most women operate in small plots, they tend to manage small firms and concentrate in less profitable sectors. Consequently, households headed by males can earn more income than households headed by female. Therefore, it is expected that household headed by male spends more in education than household headed by female.

Hypothesis 1e: Household headed by male spends more in education than those headed by female

2.3.2 Household Characteristics and Education Expenditure

Refers to assets owned, tribe, religion, housing expenditure, the size of the family and family stability.

Household production function model asserts that household will spend in education as long as they increase the general utility level. However, household utility is determined by socio-economic factors that affect household budget. Moreover, according to Human capital theory, expenditure on education raises the standard of living. Therefore, it is expected that the level of consumption of the households in education is positively related to income level. As household income increase, households tend to increase the expenditure on education. Moreover, Kambhampati (2008) confirmed that if the income of the household is low, the level of spending in education is low.

Hypothesis 2a: Household earning higher income spends more in education than household with low income.

Income level of the households depends on various assets owned by the family which increase the wealth of the family. The level of wealth is consistent with expenditure and income measures (Rutstein, 1999). Ownership of house and land may capture a wealth effect of durable assets on income of households. Kim and Lee (2010) found households that own houses spend more in private tutoring in Korea.

Moreover, Smits, Rani and Huisman (2010) confirmed that in wealthier families, the direct costs associated with education, such as fees, books and uniforms are less likely to be an obstacle.

Hence, the availability of durable assets such as land and house in the household may increase the probability of spending in education. Therefore, it is expected that ownership of durable assets in the household is positively related to the expenditure on education.

Hypothesis 2b: Household who own a house spends more in education than household who does not own a house.

Hypothesis 2c: The number of acres of land owned by household is positively influencing household education spending in the area.

Demographic burden on the households which is measured in terms of the size of the household determine also the level of expenditure to be used in education. Households are likely to spend less on education as the size increases since the family increases also the demand for other alternative purposes (Tilak, 1991). Moreover, Becker and Lewis (1973) emphasise that per capita human capital expenditure decline as the household size increases. Housing expenditure (eg rent, property taxes, insurance, utilities and housing related fees) directly impacts the family resources available to spend in school and extra-school educational inputs (Kutty, 2008). High housing expenditure affects negatively the production of children's education. Hence, larger family makes it harder for households to support education to all children. Therefore, the presence of many households is likely to have negative effects on education expenditure. On one hand, the size of the household may contribute to negative effects on education; on the other hand more people in the family may contribute to positive effect on the allocation of extra resources to education through their participation in economic activities which may increase the family budget. For instance, Tilak (2002) found an increase in the number of people leads to increase of total education expenditure on India. Therefore, it is expected that the size of the household may be negatively or positively related to education spending

Hypothesis 2d: The size of the household significantly related with household education spending the area

2.3.3 Child Characteristics and Education Expenditure

Refer to **sex** of a child, ability in learning and position in the family within the household.

Due to various social and cultural reasons, households may spend more or may have a preference to spend on education of their sons than daughters or vice versa (Quang, 2012). Sex of a child matters because of differences in expected labour market returns to education by gender which in turn affects the household's

readiness to spend on education by gender. For instance, Tansel (2002) found that parents educate more girls in Turkey due to higher education returns compared to boys. In areas where labour market discrimination against women continues the monetary returns for households educating males are greater than the returns from educating females. In some traditions, girls after marriage are generally expected to become part of their husband's household. For that matter, households retain a smaller proportion of girl's future earning (relative to boys future earnings) because girls typically contribute to their husbands households (Shafiq, 2011). Therefore, some households do not invest much in daughter's education since return accrues to their future husband's family.

Hypothesis 3a: The level of spending in the household increases as the proportionate number of girls increases as compared to the increases of proportionate number of boys.

According to Neman and Owen (2011) birth order affect the education attainment to children. First born children may receive less education as there is a greater need for them to stay at home and help household chores, for example taking care of younger siblings. Therefore, the opportunity cost for schooling is higher for first born children than for their siblings. On the other hand, according to Al-Samarral and Tessa (1992), children born into the family early when resources are stretched over fewer member of the household may be more likely to go to school and hence spend more than other later children in the family.

Nerman and Owen (2011) argued that parents are willing to spend more for biological children than for non biological children and hence biological children receive more education than non biological children. On the other hand, according to Shafiq (2011) the presence of other children in the family does not affect the decision of the household on spending in education.

Number of students may contribute negatively or positively toward household education expenditure. For instance, increased the number students reduce the

amount of private tutoring due to scarce resources in the household (Kim & Lee, 2001). Moreover, Tansel and Bircan (2004) asserted that per capita human educational expenditure is inversely related to number of students in the household. However, Quang (2012) argued on the positive correlation between the number of students in the household and household spending on education.

Hypothesis 3b: Number of students in the family is positively influencing household education spending in the area.

2.3.4 School Characteristics and Education Expenditure

Refers to existence of the school within the habitation, existence of incentive scheme in school such as provision of mid day meals, pupils teacher ratio and type of institution whether it is government or private school.

Availability and quality of schools are important determinant of education participation particularly for the poor households and girls (Buchman & Hannum, 2001). According to Mingat (2007) distribution of schools across the country play a role, because it determines the distance children have to travel to school. In that regard, the availability of school within the habitation reduces household expenditure as transport costs are reduced. Moreover, Glick and Sahn (2006) found that children who live farther away from school are less likely to be educated in Madagascar. Therefore, it is expected that locating a school close to households will be inversely related to household educational expenditure.

Hypothesis 4a: The location of the school is significantly influencing household education spending in the area.

Quality of education determines the level of educational expenditure among households. Quality of education can be measured in terms of availability of well trained teachers, appropriate student-teacher ratio, good infrastructures and availability of teaching and learning material such as books. Parents often realise that their children gain more from higher quality education.

Therefore, household are willing to spend more when they recognise the quality of education to be better (Rose & Tembon, 2000). However, Tilak (2002) argued that if household perceive that quality of human and physical infrastructures in the school is inadequate they feel compelled to invest in education. For instance, pupils-teacher ratio determines the amount to be spent by households in private tutorial which increases the fee expenditure on education. In this regard, schools with inadequate supply of resources compel households to spend more on education.

Private and secondary schools differ in expenditure levels. This mainly is due to difference in their fee levels. School fee has been abolished in government schools for primary and ordinary level. Government school receives subsidies from the government which reduces the amount to be spent by household. Therefore, expenditure is expected to be higher if a child is enrolled in a private school than in government school.

Hypothesis 4b: Household who sent children in private school spends more in education than household who sent children in public school.

Table 2.1 Expected Signs of Variables under Study

Variable	Expected sign
Household head characteristics	
Education level	Positive influence (+)
Sector of occupation	Positive influence (+)
Age	Positive /Negative (+/-)
Sex	Positive/Negative (+/-)
Marital status	Positive influence (+)
Household characteristics	
Income	Positive influence (+)
Household ownership	Positive influence (+)
Acres of land owned	Positive influence (+)
The size of household	Positive/Negative (+/-)
School characteristics	
Location of the school	Positive influence (+/-)
Type of the school	Positive influence (+/-)
Student characteristics	
Proportionate number of girls	Positive /negative (+/-)
Number of students	Positive/negative (+/-)

Source: researcher's own design (2016)

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents a description of the procedures and strategies that were used in the study. The discussion is focused on the research design, location of the study, target population, sample and sampling procedures, the research instruments and techniques, validity and reliability of the research instruments and data collection procedures and its analysis.

3.1 Research Design

The study employed a cross sectional research design in finding out the overall picture of the determinants of households spending in education in Sumbawanga Municipality. A cross-sectional research design permits collection of data in a particular place at one point in time. The cross-sectional design is the most efficient method of data collection in terms of time and financial resource (Kothari, 2004). This study design is capable of estimating the relationship between different variables used in the investigation. However, it is constrained by not being capable to reveal the causal relationships (Gray, 2009).

3.2 Study Area

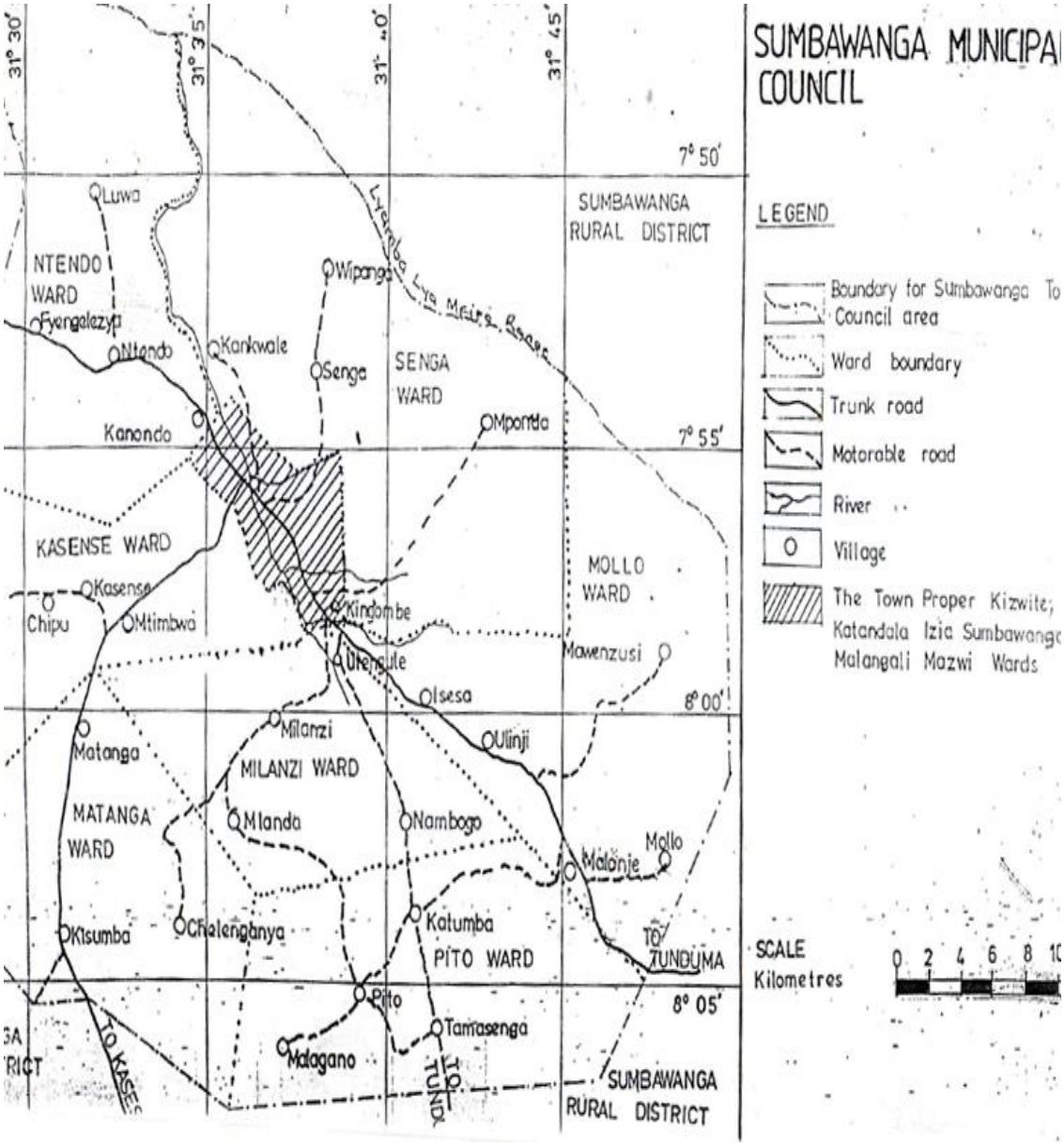
3.2.1 Location, Population and Climate

The study was conducted in Sumbawanga Municipal council which is one of the four districts in Rukwa region. It is found in South-West Tanzania in South Highlands of Ufipa Plateau. Sumbawanga Municipal council lies between latitude $07^0$48' to $08^0$31' South of the Equator and Longitude $30^0$29' to $31^0$49' East. The area lies at an altitude between 1,700 Metres and 2,419 Metres above sea level and occupies an area of 1,329Km^2. According to 2012 Population and Housing Census, the area has population of 209,793 people and a population density of 158 /km^2. In

2030, the population in Sumbawanga Municipality is projected to be 325,980 whereas 45% will be the school age children (Municipal Profile-2016).

The municipality has two (2) divisions namely Lwiche and Itwelele, and fifteen (15) wards, 24 villages and 121 sub villages. The study was conducted at the central part (town proper- figure 3.0) of the municipal council consisting of Izia, Mazwi, Katandala, Majengo, Momoka, Malangali, Chanji and Kizwite wards.

Figure 3.1: A map showing the area under the study



Source: Sumbawanga Municipal council Profile (2014)

The municipality is characterised by dry sub-humid climate for most part of the year. The average temperature is 27^0C. It is cool, dry and often cool from May to October. The coolest months are June and July when the temperature ranges between 16^0C to 5^0C.The municipal council gets moderate rainfall of 900mm to 1000mm per year with an average of 646.8mm. Rainfall begins in November and ends in late April.

3.2.2 Economic Activities

The economy of Sumbawanga municipality depends on subsistence agriculture. About 80 percent of the population depends on agriculture. The municipal council is the largest foods producing area with the area of 89000 Ha of which 64516 Ha are suitable for agriculture where 63476 Ha are under cultivation more particularly for food crops. The main food crops which are produced are maize, beans, wheat, potatoes and sunflowers. The main buyer of maize is the NFRA, the government entity and other business persons who export commodities to other regions and nearby countries namely Zambia, Democratic Republic of Congo (DRC), Kenya and other African Countries (Municipal council profile-2014).

Table 3.1: Productions of Major Food Crops

Crop	Season 2013/2014		
	Expected (Ha)	Cultivated (Ha)	Yield (Ton)
Maize	30,722	30,000	60,645
Beans	21,023	19,000	18,726
Sunflower	4,612	3,000	3,021
Wheat	1,555	1,250	1,588
Potatoes	746	500	2,252
Others	954	896	1,127
Total	59,612	54,646	87,345

Source: Sumbawanga Municipal Council Investment Profile (2014)

Livestock keeping is the second largest economic activity in Sumbawanga Municipality particularly in rural areas. The type of livestock and husbandry mechanism vary significantly from one shepherd to another with the majority raising traditional breeds. Domestic livestock which are kept includes cattle, goats, sheep, chicken and pigs. The main livestock products produced include milk, meat, eggs and skin which are sold to local market unprocessed. Statistics of domestic animals in September 2014 is shown in Table 3.2.

Table 3.2: Domestic Animals

Animal	Cow	Goats	Sheep	Pig	Chicken	Duck
Total	42601	20027	1247	11458	150275	5830

Source: Sumbawanga Municipal Council Investment Profile (2014)

There are no large-scale industries in Sumbawanga Municipality like other areas of Tanzania. However, there are small-scale industries privately operated such as saw milling, grain milling and other small industries owned by SIDO, SAAFI industry for meat processing and Dew Drop Company which produce pure drinking water.

Other economic activity in Sumbawanga Municipal is employment in the public sector (government and parastatal) and in private sectors. Employment in private sector is found in small scale industries such as carpentry, brick making, welding, grain milling and saw milling. Also, people are self-employed in transport activities through bodaboda, Hiace, motorcycle and in trade.

Moreover, Sumbawanga Municipality is endowed with fascinating touring attraction especially in cultural and antiquities such as castles of thief at Sumbawanga Asilia area, Mountain chiefs of Milanzi and existence of rarely wild animals like red colobus Monkey at Mbizi Natural Forest and Clay furnaces found at Kingo'mbe. Close to Sumbawanga Municipality there is Katavi National Park and Kalambo Falls.

3.2.3 Education Services in the Area

This section explains the availability of educational services in Sumbawanga municipal. It is divided into two parts, namely primary and secondary education. The aim is to show the trend and access of education in the area of study.

3.2.3.1 Primary Education

The municipal council has 58 primary school of which, 55 are government owned schools and 3 are privately owned. In 2014, the municipal council had 45438 pupils in primary schools whereby 23658 are girls and 21780 boys. Enrollment rate in primary schools had steadily increased in recent year. In 2014 enrolment rate was 92.5% compared to 90.23% recorded in 2013. Employment of teachers for primary schools is relatively astounding. In 2014 through the support of the central Government, the municipal council managed to employ 78 teachers raising the

number of teachers to 921 from 843. The requirement of teachers for primary schools is 1,068 then the deficit is 147 teachers.

3.2.3.2 Secondary Education

The area has 27 secondary schools of which 17 are government owned schools and 10 are managed by private entities. In 2014, the municipal council had 13069 students in secondary schools whereby 6058 are girls and 7011 boys. Enrollment rate in secondary schools has been on the rise in recent years; in 2014 for instance enrolment rate was 73.9% compared to 65.3% recorded in 2013. Employment of teachers for secondary schools has relatively increased. For instance in 2013 through the support of the central Government, the Municipal council managed to employ 65 teachers raising the number of teachers to 682 from 617. The requirement of teachers for secondary schools is 911. The municipality is facing a severe shortage of science teachers. 102 (37%) science teachers out of 275 required are available (Municipal profile-2014).

Table 3.3: Teachers in Secondary Schools

Teachers	Requirement	Available	Percent (%)	Shortage	Percent (%)
All Teachers	911	682	74.9%	229	25.1%
Mathematics teachers	78	31	39.7%	47	60.3%
Physics Teachers	73	14	19.2%	59	80.8%
Chemistry Teachers	58	33	56.9%	25	43.1%
Biology teachers	66	24	36.4%	42	63.6%

Source: Sumbawanga Municipal Profile (2014)

The area is among the lowest municipalities performing poor in secondary education and there is no any study which has been conducted on the determinant of spending of households in education which can be used to improve the quality of education. For instance, in 2011 CSEE results, the pass rate for Sumbawanga Municipal council was reported to be 9.22%. This result is below the national target of 70% (Nyandwi, 2014). Moreover, in 2011 CSEE results the best five regions were Kilimanjaro (16.64%), Dar es Salaam (11.97%), Mbeya (12.04%), Coast (11.92%) and Arusha (11.90%) respectively. The bottom five regions were Rukwa (6.95%), Singida (6.31%), Tanga (5.45%), Mtwara (4.99%) and Lindi (4.41%) (URT, 2012).

The statistics on CSEE performance for past three years does not show a good trend as compared to other areas in Tanzania as shown in Table 3.3.

Table 3.4: Performance in CSEE

Year	Registered	Attended	Not attended	Pass (%)	Fail (%	Position National wise
2013	2917	2767	151	47.3%	52.6%	32/167
2014	2011	1971	40	81.9%	18.06%	20/169
2015	3333	3262	84	76.5%	23.6%	25/170

Source: Municipal educational office (2016)

According to Singleton (1993), the perfect setting is one that is related to the researcher's interest, is easily accessible and that allows the development of instant relationship. The choice of this area was determined by the interaction that the researcher have with households and the availability of data. The familiarity of the researcher with the study area made it easy for him to develop immediate relationship with the respondents hence making the process of data collection less awkward.

3.3 Target Population and Unit of Analysis

The population from which the sample was extracted involve household having children who are studying in secondary schools in both public and private schools in Sumbawanga municipality. The unit of analysis in this study is a household.

3.4 Sample and Sampling Techniques

Both probability and non probability sampling techniques were applied to select respondents. The purposive sampling was used to select 8 wards so as to obtain a required number of respondents who as much as possible formed a comprehensive case study. According to Kothari (2004), purposive sampling is helpful to gain respondents who represent the diversity of sub social groups among the population as it allows the researcher to choose respondents on the basis of predetermined criteria. The survey was designed to obtain a representative sample of household in the Municipal council. Ward educational officers were used in obtaining the number of households present in their areas.

The total of 2000 households was recorded and selected to be a sampling frame. This made the researcher to select the appropriate number of respondents to be used in the study.

3.5 Sample Size

The selection of sample size was based on statistical principles. Household were sampled basing on stratified random sampling method. The selected households had various socio-economic levels and other characteristics including age, education background and family income. There were three social economic levels that are high, middle and low. The study adopted Slovin's formula in calculating the number of respondents. The Slovin's formula was as follows (Dhokhikah, Trihadiningrum and Sunaryo, 2015).

$$\eta = \frac{N}{N \times d^2 + 1}$$

Where; η = number of Sample

N = Total number of population of household

d = error margin = 0.09 (9%)

$$\eta = \frac{2000}{2000 \times 0.09^2 + 1} \approx 116$$

However, the sample size was reduced to 105 (9%) due to the missing information to some of the respondents on either fee or non fee education expenditure.

A modified Slovin's formula was used to determine the sampling distribution in each ward.

$$x = \frac{n \times 105}{\eta}$$

Where; x = Number of respondents in the ward

n = Number of households in the ward

η = Sample size

The number of respondents in each ward is presented in Table 3.5

Table 3.5: Number Respondents in Wards

Ward	Target households	Number of respondents	Percentage (%)
Chanji	200	11	10.4%
Izia	200	11	10.4%
Katandala	418	22	20.9%
Kizwite	240	12	11.4%
Majengo	250	13	12.4%
Malangali	182	10	9.5%
Momoka	160	8	7.6%
Mazwi	350	18	17.1%
Total	**2000**	**105**	**100%**

Source: Household Survey Data (2016)

3.6 Data and Data Sources

The study used primary data which were both qualitative and quantitative in nature. Qualitative data are those collected, analysed and interpreted by observing what people do and say (Ngechu, 2006). Quantitative data are quantifiable data (Ngechu, 2006). Data were collected through questionnaire distributed to household head and interview to educational officers. Study used primary data because in most cases household expenditure keeps on changing with time and preferences. Furthermore, the study used both quantitative and qualitative information to ensure a significance findings and enthusiastic conclusion.

3.7 Research Instruments

The study used both questionnaires and interview schedule in collecting data. Questionnaires were used to collect the primary data from households. A questionnaire was chosen because of the ability to gather a lot of information within the short time. The interview schedule was used to probe for more information from educational experts

3.7.1 Questionnaires

According to Orenge (2011) a questionnaire is used to gather data which allow a measurement for or against a particular view point. Further, a questionnaire has the ability to collect a large amount of information in a reasonably short period of time.

Best and Khan (1993) observed that questionnaire enables the person administering them to explain the purpose of the study and give meaning of the items that may not be clear. The researcher developed questionnaires containing both closed and open ended questions which were used for data collection. The questionnaires were divided into four sections where each section contained the questions for achieving each of the research objectives. Section A consists of questions which involve household head characteristics, section B consists of questions involving household characteristics, section C consist of questions which involve student characteristics and section D consists of questions which involve the school characteristics.

The questionnaires were personally delivered to premises of the respondents. To some respondents, questionnaires were left and picked later in order to give them enough time to search for requested information. However, to some respondents who were illiterate the question was read by the researcher and then translated into local language for clear understanding.

3.7.2 Interview Schedule

Orenge (2011) states that an interview is one of the most important source of data and define the interview as a two way conversation that gives the interviewer the opportunity to participate actively in the interview. According to Yin (2003), the open ended type of interview is the most commonly used interview method. In this type the study asks the respondent unstructured questions, allowing the interview proceed with open discussion. Orenge (2011) observed that more people are willing to communicate orally than in writing. The interview schedule assisted the researcher to probe and find out more information from education officials to identify their view on household expenditure on education. Ten (10) heads of schools from private and government secondary school were purposively chosen

3.8 Pilot Study

A pilot study was conducted by using fifteen (15) respondents purposively selected from Kantalamba ward. The purpose of the pilot study was to pre test the research instruments and thus ensures their validity and reliability. According to Mugenda and Mugenda (1999), piloting ensures that research instruments are stated clearly and have the same meaning to all responds.

Therefore, piloting ensure the simplicity and sustainability of language used in the final instrument for the actual data collection (Orenge, 2011). After the pretesting some questions were modified and/or added before the full scale survey was conducted.

3.9 Validity and Reliability of the Data

Validity is the quality that an instrument used in research is accurate, correct, true, meaningful and right (Msabila & Nalaila, 2013). Reliability is the measure of the degree or extent to which a research instrument yields consistent results of the data after repeated trials (Msabila & Nalaila, 2013). These two qualities are important in research as they have a great influence on the research and conclusion to made regarding to research findings (Kothari, 2004). Therefore, the instruments for this study were tested for validity and reliability to determine whether they need improvement or not

3.9.1 Validity Issues

A valid instrument should accurately measure what is supposed to measure. In order to establish validity of instruments, the draft questionnaires were given to the supervisor. He was requested to comment on the question wording and depths of the questionnaire and its relevance to research objectives. The comments that were obtained helped to improve the research instruments. The feedback from the pretesting procedure was used to validate the instrument in readiness for the study.

Furthermore, basing on the comments given by the research supervisor and other professionals well versed in research, modification was made on research instruments where necessary.

3.9.2 Reliability Issues

If the quality of reliability is satisfied by an instrument, then while using it we can be confident that the transient and situational factors are not interfering (Kothari, 2004). To ensure reliability of the research instrument, the researcher used simple language and clear instruction which were appropriate to the respondents. The instruments were pre-tested in a pilot study. The researcher pre-tested a total of fifteen (15) questionnaires. The split-half method was used to test the consistency of the research instruments. Items in the questionnaire were split into two categories even and odd numbers. The sums of all even numbers of items and odd numbers were computed separately.

The odd numbered scores correlated with scores even numbers. One problem with the split half reliability coefficient is that since only half the number of items is used the reliability coefficient is reduced (Shafiq, 2011).To get a better estimate of the reliability of the full test, the study applied the Spearman Brown Prophecy correction test as shown below.

$$Re = \frac{2r}{1+r}$$

Where;

Re = Reliability of the original test.

r = reliability of coefficient resulting from correlating the score of the odd items with the scores of even items.

3.9.2.1 Steps involved in Calculating Reliability Coefficient

In calculating reliability coefficient, the study adopted and modified the steps used by Orenge (2011) to ensure the validity of the procedure.

1. Items were sampled from the domain of indicators that measure the variable
2. Questionnaires were administered to a group of 15 sampled respondents
3. All the odd-numbered items and all the even-numbered items were grouped together
4. The sum of each group of items was computed.
5. The Correlation (r) of the scores from two groups of items for all questionnaires was computed and the result found to be 0.74.
6. Due to problems associated with split half method, the researcher applied the Spearman Brown Prophecy correction full test. The result was found to be 0.85.

According to Orenge (2011), a coefficient of 0.80 or above is reliable. The study therefore concluded that the instrument was reliable.

3.10 Description of Variables and Measurement

Measurement is the assignment of numbers to objects to represent amounts or degree of a property possessed by all of the objects (Msabila & Nalaila, 2013). It is carried out in order to provide statistics that can be used in verifying the hypothesis (Kothari, 2004). Kothari (2004) categorised measurement into four type, namely nominal, ordinal, interval and ratio. In this study, Qualitative variables were measured on a nominal scale. Quantitative variables were measured on an ordinal, interval or ratio scale.

3.10.1 Dependent Variable

The dependent variable is household expenditure on education in Tanzanian shillings. The expenditure was calculated as the sum of the direct and indirect annual expenditure per child studying in a secondary school. The expenditure had three main components namely fees, non fees expenditures and total per capita expenditure. A fee consists of total amount of money paid to school as a direct cost (school fees) and amount paid for extra tutorial classes (tuition fees).

Non fee items consist of expenditure on uniforms (trousers, skirts, shirts, shoes, T-shirts, socks and shamba dress), transport and learning materials. Total per capita expenditure consists of expenditure for both types of fees. For any student education expenditure varied from zero to some positive amount. In each category the dependent variables were measured by taking the average amount paid by household per student. The study adopted the similar method of measurement used by Tilak (2002), Shafiq (2011) and Choudhury (2011).

3.10.2 Explanatory Variables

Explanatory variables were divided into four groups which are children characteristics, household head characteristics, school characteristics and household characteristics.

Household head characteristics consist of sex, level of education (years of schooling), marital status, occupation and age. Sex refer to biological characteristics of the household head, whether a female or a male. The nominal scale adopted from Ogundari and Awudu (2014) and Ngwilizi (2013) was used to measure its effect in educational spending of the household. Level of education (years of schooling) consists of no formal level of education, primary level of education, secondary, college and university level. Similar to Quang (2012), Sulaiman, Ismail and Othman (2012) and Ogundari and Awudu (2014) levels of education from non formal to university were measured by using nominal scale. Marital status of the household head will refer to either the household head being married or not married (divorced, widowed or separated). For the purpose of the study unmarried categories were grouped together and used as a base category in line with Tilak (2002) and Rojas (2012).

In line with Sulaiman, Ismail and Othman (2012), major sector of occupation of the household head is whether the household head is specialised in private or public sectors. Private sector refers to Agricultural activities, Artisan/petty shop/small business, rentier and/or domestic work. Similar variables were used by Tilak

(2002). All household heads in public sector are salary employee. Age of the household head is the number of years the household head lived at the time when made contact with a researcher. Similar to Ngwilizi (2013), Choudhury (2011), Donkoh and Amikuzuno (2011) and Kim and Lee (2010) the age of household head was measured by using the ratio scale.

Household characteristics consist of average annual household income earn by household from various sources. Income was calculated by summing amount of money received from salary, livestock, farming activities, house rent, and/or trade. It was measured on the ratio scale in line with Tilak (2002), Ngwilizi (2013) and Choudhury (2011). The size of the family refers to the total number of people living in the household. It includes both dependants and non dependants. It was measured as a continuous variable in line with Ogundari and Awudu (2014) and Ngwilizi (2013). The effect of resources was analysed by using the available durable assets owned by the household. For the analysis of this study, land and house were employed. In line with Donkoh and Amikuzuno (2011), ownership of a house was captured by the use of dummy variable as to whether or not a household owned a house. Land was measured by using number of acres owned by the household.

School characteristics refer to whether a school is public or private and the place where it is located. For the purpose of this study schools were grouped into three categories, that is, public, private and both government and public school. Some households may have children in both types of schools. Three types of locations of the school were employed in the study, namely districts, in region and outside region. Nominal scale adopted from Tilak (2002) was used as a unit of measurement.

Children characteristics consisted of sex of the child. Sex refers to biological characteristics of a child such as a male or a female. In this study, the proportionate number of girls and boys with respect to available number of students in the family was used. The ratio scale which was similarly employed by Tansel (202) and Quang (2012) was used in the measurement of the variable.

Table 3.6: Summary of Variables and their Measurements

Variable	Meaning of Variable	Measurement
Dependent variable		
Educational expenditure	Amount of money paid for education annually for one child	Total amount of money paid per student per annum (continuous variable
Non -fees expenditure	Indirect costs paid for education annual for one child	Total household expenditure excluding fees (Tsh) (continuous variable)
Fee expenditure	Direct cost and extra tutorial (tuition) paid for one child	Amount of money paid per student excluding non fee (Tsh) (continuous)
Explanatory variable		
Household head characteristics		
Age of household	The length of time that a household has lived	Number of complete years a household lived when contact with a researcher (continuous variables)
Sex	Biological characteristics of the household head	Dummy variable with female headed household being a reference category. 1 if is the male headed household 0 otherwise (female headed household).
Marital status	Fact of being married or not	Dummy variables with the reference category being unmarried household head. 1 if the household head is married 0 otherwise
Education level	A stage in a scale of progression or quality in education	Dummy variable with non-formal being a base category 1 if primary level, 0 otherwise 1 if secondary level, 0 otherwise 1 if college level, 0 otherwise 1 if university level, 0 otherwise
Sector of occupation	Area of specialisation in which a household head perform his/her job to earns a living	Dummy variable with private sector being a base category 1 if government 0 otherwise (private).
Household characteristics		
Household size	Number people living in the household	Average total number of people in the household (continuous variable)
Household income	The amount of money received over a period for work, goods or service or as profit on capital	Average total annual household income (Tsh) (continuous variable)
Land holdings	A piece of land that is leased	Total number of acres of land owned by household (continuous variable)
House ownership	The legal right of possessing a house	1 if the household owns a house, 0 otherwise (dummy variable)
School characteristics		
Type of school	The category by which the school belongs to.	Dummy variable with the reference category being private school 1 if government, 0 otherwise.
School location	The geographical site or position of the school	Dummy variables with the reference category being school located in region 1if the school is located within the district 0 otherwise 1 if the school is located outside region 0 otherwise
Student's characteristics		
Sex	Biological characteristics of a student	Proportionate number of girls and boys in the household (Continuous variable).

3.11 Data Analysis

Data from household questionnaire surveys were sorted, edited, coded and summarized by using the Statistical Package for Social Sciences (SPSS) software. The data from completed questionnaires was scrutinised to assure that the data are accurate, consistent with other facts gathered, uniformly entered, as completed as possible and have been well arranged to facilitate coding and tabulation. Coding decision was taken at the designing stage of the questionnaire. Categorical data was given numbers to represent them. This made possible to pre code the questionnaire choice and which in turn helpful for computer tabulation as one can straight forward key punch from the original questionnaires (Kothari, 2014). Both Descriptive statistical analysis and inferential analysis were used to analyse the data.

3.12 Research Model and Estimation Techniques

The study analysed the determinant of education expenditure on education expenditure. Dependent variables were divided into three categories, namely, non-fee, fee and total per capita expenditure on line with Tilak (2002) and Choudhury (2011).

3.12.1. Estimation of Fee per Capita Expenditure Model

The study used Tobit model which was proposed by James Tobin in 1958. It is the probability model designed to estimate statistically the relationship of limited dependent variables to the other independent variables in testing hypotheses. The model is used to estimate the linear relationship between the variables when there is either the left or right censoring in the dependent variable (Carson, 2007). In line with Quang (2012) and Shafiq (2011), the study adopted the Tobit model because the dependent variable includes zero values and some positive integers. Households who spent zero can be observed and censored easily by Tobit model.

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According to Amemiya (1973) there are three cases from which the analysis of Tobit is not allowed;

(i) If the dependent variables take on the negative values

(ii) If the dependent variable takes only the positive values

(iii) If the zeros in the data are the result of non - observation (non negative distribution) rather than true censoring at zero

However, the model is constrained by a problem of estimating parameters by regressing the observed y_i on x_i which can produce inconsistent estimates. If we include the censored observation ($y= 0$) the estimates will yield under estimates of the intercept and overestimate of the slope. If we exclude the censored observation and just use the observation for which ($y > 0$) that is truncating the sample, the estimates will yield overestimate of the intercept and underestimate of the slope (Amemiya, 1973). If we estimate the observed observation by using OLS, estimates of the parameters obtained will be biased as well as inconsistent, that is, they are biased even asymptotically (Gujarati, 2004). Therefore, the Tobit model was estimated by the maximum likelihood estimation techniques in order to capture all the information, including household with no fee expenditure. However, the Tobit model estimation problem is related to the estimation of censoring threshold. Normally, the censoring threshold is assumed to be zero while the fact is that it is not zero. This also provides inconsistent estimates of the regression analysis of the data. For a consistent Tobit model estimate the unknown censoring threshold should be estimated by using minimum of observed dependent variable Y_i (Curson, 2007).

Tobit model is defined by the relationship between variable y_i and independent variable X_i assuming that there is latent (unobservable) variable y_i*. Latent variable (y_i*) linearly depends on X_i via parameter β which determines the relationship between independent variable (vector X_i) and the latent variable y_i*. In addition, the there is a normal distributed error term μ_i to capture the random influence on the relationship.

The observed y_i is equal to the latent variable whenever the latent variable is above zero (Maddala, 1992). For that reason the standard Tobit model is defined as;

$$y_i = \begin{cases} y_i^* = \beta_0 + \beta_i X_i + \mu_i & \text{for those with positive expenditure on education} \\ 0 & \text{for those with no expenditure} \end{cases}$$

$$\mu_i \quad IN\ (0, \delta^2)$$

Where y_i is the latent variable

X_i (i ranges from 1… n) is the vector of determinant characteristics of the household expenditure

β_i (i ranges from 1…n) are the regression coefficients to be estimated that measure the extent to which various variables (X_i) influence the household expenditure on education

β_0 is the intercept term which is interpreted as average value of the dependent variables when all the explanatory variables are equal to zero

μ is the error term that is to be estimated by the model.

The observed y_i (education expenditure) is defined as $y_i = 0$ if $y_i^* = 0$ and $y_i = y_i^*$ if $y_i > 0$.

Therefore, in estimating fee per capita expenditure households with zero expenditure were censored. The dependent variable (fee per capita expenditure) was observed when education expenditure is greater than zero.

3.12.2 Estimation of Non-Fee and Total per capita Education Expenditure Model

The study used multiple regression models in the analysis of non-fee and total per capita expenditure. The study adopted the multiple regression model because the dependent variables were measured by the ratio scale. The ratio scaled can be estimated by using Multiple regression models (Andren, 2007). With similar reasons the Model has been employed in various studies. For instance, Tilak (2002), Sulaiman, Ismail and Othman (2012) and Choudhury (2011)

For the purpose of this study, the estimation was done by Ordinary Least Square techniques (OLS). To ensure that the assumptions underlying CLRM are satisfied, the study tested Multicollinerity and heteroscedasticity problems, specification error test and overall fitness of the model (See section 4.2)

The general specification model which was employed is;

$$\ln Y = \beta_1 + \beta_2 X + \beta_3 W + \beta_4 P + \beta_5 Q + \mu_i$$

Where, lnY = Natural logarithm of Household expenditure per capita

X = Household head characteristics

W = Household characteristics

P = child characteristics

Q = school characteristics

CHAPTER FOUR

DATA ANALYSIS PRESENTATION OF FINDINGS

4.0 Introduction

This Chapter presents the findings of the study from households with the main objective of assessing the determinants of education spending. The presentation of findings covers empirical analysis of primary data collected by using questionnaires within Sumbawanga Municipal council. The analysis of all variables was done in two stages. First, the patterns of expenditures are explained with the help of descriptive statistics of each of the household head characteristics, household characteristics, children characteristics and school characteristics. Secondly, household expenditure function was estimated which include the equations that relate Fee per capita expenditure, Non fee per capita expenditure and Total per capita household expenditure on education to determinants. Fee per capita expenditure is estimated by using Tobit regression analysis. Non fee and total per capita expenditure are estimated by using Multiple regression analysis. The variables used for analysis are quantitative in nature and some independent variables are qualitative and used as a dummy variables.

4.1 Descriptive statistics

This section explains the variables under study with the aim of presenting theoretical determinants of the household education expenditure. It covers socio-demographic and economic factors of the households. Social demographic factors include sex, age, marital status, levels of education, household size, type and location of the school. Economic factors include household income, expenditure, assets ownership and employment.

4.1.1 Education spending

The expenditure of education differs between private and public schools. Breakdown of spending varies according to the level and type of schooling as well as according to the social economic status of households. Expenditure was divided into three categories which are non fee, fee and total spending per child.

The pattern shows on average that expenditure on fee items is greater than non fee items. The findings reveal that households on average spend 400,923/=, 284,688/= and 596,397/= in fees, non fee items and total expenditure per child respectively. Basing on the income earned by households per annum, the findings show that on average, households allocate 6.8 % of their spending to education.

Regarding the sex of household head, the findings show an expected results. Households headed by males earn more income from various sources than those headed by females. However, household headed by female spends more in all educational items (Table 4.1). This is the indication that female household head devotes higher percent of the income to education compared to male household head. The results seem to suggest that female household heads view investment in human capital as their principal route out of income poverty

Table 4.1 Average Expenditure of Household

Household head	Average income (TSh)	Average expenditure per child (TSh)					
		Fees	%	Non fee	%	Total expenditure	%
Male	1,118,170	405,673	36.3	291,241	26	606,968	54.3
Female	682,900	360,333	52.8	228,100	34.4	505,100	74

Source: Survey Data (2016)

Schools fees appeared to be dominant spending for private schools whereas spending on school uniforms and learning materials are the main expenses in public schools. For private schools and 'A' level schools, school fees are the main budget item accounting for almost 50% of household education spending, as compared to about 33% for school expenses and learning materials. However, this pattern does not apply for public (ordinary level schools) where spending on school materials is

the greatest since the schooling is free. The average household spending per annum by type of school is shown in Table 4.2.

Table 4.2 Average Household Expenditure by Type of School

Item	Public school (TSh)	Private school (TSh)
School fees	70,000/=	1,497,000/=
Uniforms	74,000/=	123, 000/=
Learning materials	75,000/=	150, 000/=
Transport	90, 666/=	150,000/=

Source: Survey Data (2016)

Furthermore, the results of the study show that the amount of money that a household devotes to its children increased with the number of children enrolled in secondary schools. For instance, the average fees for households having children in both private and public schools is 1,566,666 TSh which is 4.7% larger than the cost of household having children in private schools only. The study reveals that household with income below the average prefers public education to private education. In general, the unit cost in the private schools is at least two times higher than those in public school. The average household unit cost was calculated by summing up all the spending made by household regardless of their social economic characteristics.

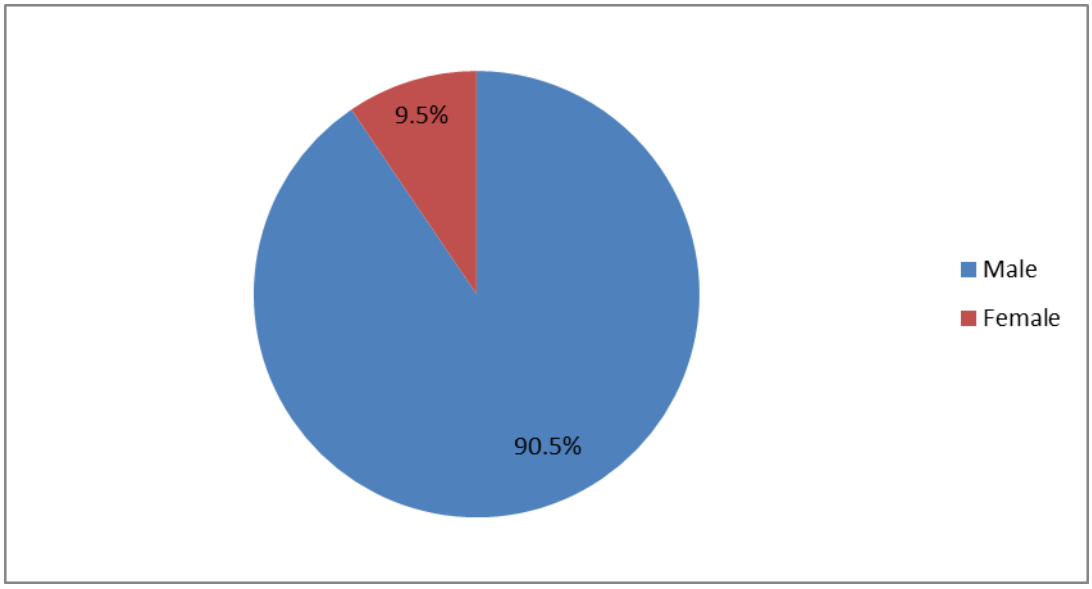
4.1.2 Household head characteristics

The characteristics of household head have an important social and economic implication in education spending among household. They have significant impacts on living conditions of household members, household size, child upbringing, the consumption of goods and services and the occurrence of demographic phenomena such as marriage, death and migration (Takwa, 2005). The household head characteristics include sex, age, level of education, marital status, major occupation and sector of occupation.

4.1.2.1 Sex of Household Head

The study considered the sex of the household head to study variations in the view and perceptions and the role played by both female household head and male household head regarding the education expenditure. The findings of the study show that out of 105 households surveyed, 95 households (90.5 %) were male headed households and 10 (9.5%) were female headed households (Figure 4.1)

Figure 4.1: Sex of household head



Source: Survey Data (2016)

This assessment suggests that most of households are headed by male. The survey results show the decreasing trend as compared to 2011/12 HBS which revealed that about a quarter (24.7%) of Tanzanian Mainland household are headed by females.

4.1.2.2 Age of the household head.

The distribution of household head's age reveals that the average year of the household heads under study is 41 years. With regard to female household head the average years is 39 years. Moreover, the study shows that the male households have the average years of 42 years (Table 4.3)

Table 4.3: Ages of Household Head

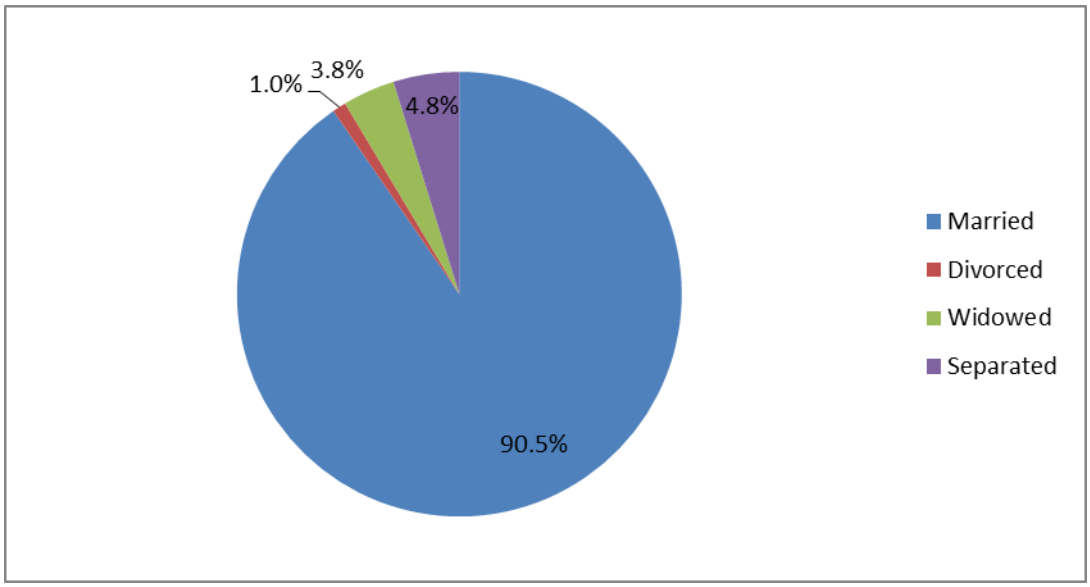
Respondents	Number of respondents	Minimum	Maximum	Average
Female headed household	10	30	60	39
Male headed household	95	29	73	42
Total respondents	105	29	73	41

Source: Survey Data (2016)

4.1.2.3 Marital Status

Another household head characteristic which may influence the level of educational spending among the household is marital status. The findings from the surveyed households revealed that out of 105 household heads, 95 (90.5%) were married, 1 (0.9%) divorced, 4 (3.8 %) percent widowed and 5 (4.8%) were separated (Figure 4.2).

Figure 4.2: Marital status of household head



Source: Survey Data (2016)

The findings show that the married category dominates. This observation is similar to the national marital status which indicated that married group dominates for persons aged 15 years and above (URT, 2010). Moreover, the results show that almost all male household heads are married, while 50% of female household heads are separated, 40% are widowed and 10% are divorced.

4.1.2.4 Education Level

The researcher considered education level of household as a very important demographic characteristic from which people not only get to know about themselves but also what happens around them. The education level of the household head determine their access to gainful employment and hence the well being of the household. It is believed that the level of education is related to the awareness towards education expenditure. In the analysis of the level of education of household head, the levels of education were categorised into four education levels including no formal education, primary, secondary, college and university level. The results are shown in Table 4.4.

Table 4.4: Educational Levels of the Respondents

Education level	Frequency	Percentage (%)
No formal level of education	3	2.9
Primary level	17	16.2
Secondary level	16	15.2
College level	40	38.1
University level	29	27.6
Total	105	100

Source: Survey Data (2016)

The higher percentage of college education to household might be contributed by the effort made by the government of Tanzania and private sector in building many vocational and training colleges. Regarding household with no formal education the findings show that all 3 household head with no formal level were male. Out of 3 male household 2 (66.7%) are able to read and write while 1(33.3%) cannot. However, the study reveals that many households are headed by female with primary level of education and many household are headed by male with college level (Table 4. 5). Moreover, the findings reveal that all 3(30%) household headed by female with university and college level were separated from their husbands.

Table 4.5: Household Levels of Education

Sex of household head	Level of education				
	Non Formal	Primary	Secondary	College	University
Male	3	12	14	38	28
Female	0	5	2	2	1
Total	3	17	16	40	29

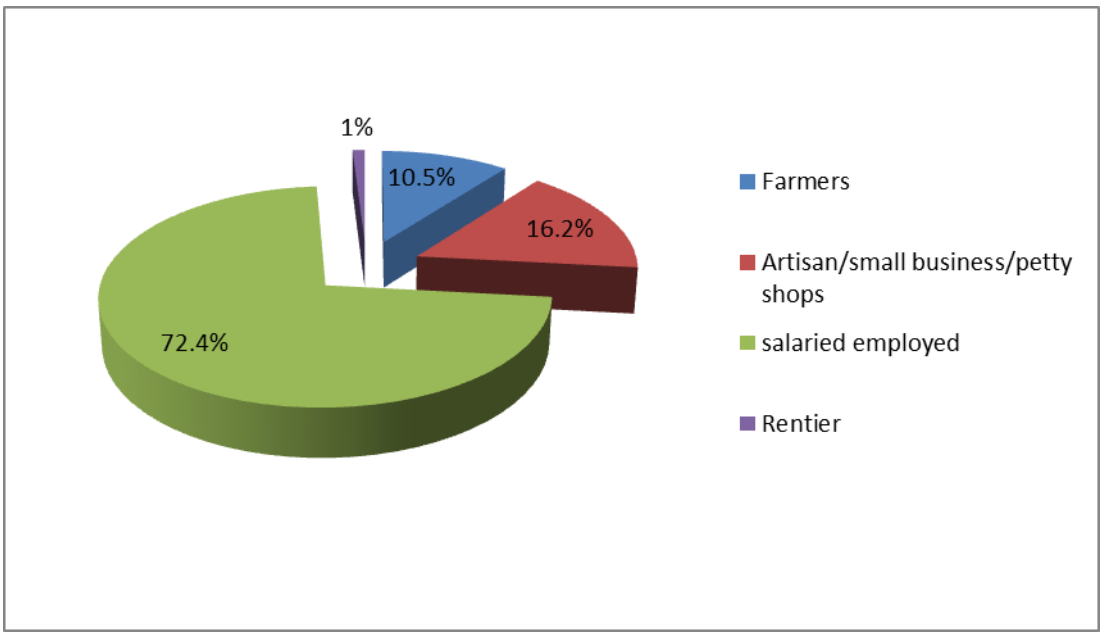
Source: Survey Data (2016)

4.1.2.5 Major Occupation of the Household Head

Occupation status determines the occurrence of demographic events such as mortality, migration and fertility which may have impacts on education expenditure. Moreover, the parent's occupation status may be linked with selection of a type of the school to be studied by a child.

The survey focused on six main occupational activities in which households were grouped: farmer, artisan/small business/petty shop, salaried employee, rentier, domestic worker and unemployed. The findings show that out of 105 households surveyed, 11 (10.5%) are farmers, 16 (16.2%) engage in artisan/small business/petty shop, 76(72.4%) are salaried employee and 1(1%) household head is a rentier. Moreover, the study reveals that in the area there is no household head engaged in domestic works as the major occupation and no household head is unemployed (Figure 4.3).

Figure 4.3: Major Occupation of Household head



Source: Survey Data (2016)

Furthermore, the findings show that out of 76 (72.4%) salaried employee household heads, 68 (63.8%) are employed in government sector and 38 (36.2%) are employed by private sector. This is due to the shortage of private institutions in the area. The findings reveal that in the area of study at least 71% of households having children in secondary schools are in formal sectors. Moreover, the findings show that 29 % of the household head engage themselves in non formal sector, 62% engaging in small business as their main occupation and 38% are specialised in faming activities. Majority of household heads with no formal level of education and primary level engage in non formal activities.

4.1.3 Household Characteristics

The characteristics of household have an important social and economic implication in education spending among household in Sumbawanga Municipality. The household characteristics include total number of people living in the household, number of dependants, assets owned and total income earned by household from various sources.

4.1.3.1 Household size

Demographic burden is considered as the important determinant of household expenditure. The impact of the size of household and education expenditure among households is uncertain. On the one hand, if the resources have to be distributed between more members, the availability for education expenditure may be reduced, but on the other hand, more people may contribute to the household budget which might positively affect allocation of extra resources to education. The survey findings revealed that in 105 household surveyed, the average size of the household is 5 members and the average number of dependants per household is 3 people (Table 4.6). With regard to the sex of the household head, female household display slightly different characteristics to male headed household. On average female household have 1 less child than male headed household.

Table 4.6: Household Demographic Burden

Item	Minimum	Maximum	Average
Household size	3	10	5
Household dependants	1	8	3

Source: Survey data, 2016

The findings show that there is an increase pattern of 4.2% from the results obtained by 2011/12 HBS which recorded the average of 4.8 in Sumbawanga Municipal council. The study also reveals that about 60 percent of the members of the household surveyed are dependants (children under age 15 and elders aged 65 or more years). The result on number of dependants in sampled household is higher compared to 2011/12 BHS results. The BHS results show that nearly half (48 percent) of household members were dependants in Tanzania Mainland in 2012 (BHS, 2011)

4.1.3.2 Assets Ownership

Household ownership of assets is an important reflection of how the poor household is increasing their efforts to reduce poverty. In the assessment of impacts of asset ownership to household expenditure, land and house ownership were separated from

other assets. Availability of these assets (land and house) increases households chances of educating its members (Pôle de Dakar, 2012). Education budget coefficient tends to increase with durable assets ownership.

Thus, a household who own land and house is more likely to afford formal education than a household which does not. With respect to land ownership, the mean area owned by households in the study area is 3 acres of land. This shows the decreasing pattern in land ownership as compared to the results revealed by 2011/12 BHS which indicated the average ownership of 6 acres for urban household and 7 acres for rural household (BHS, 2011)

Regarding house ownership, the results revealed that out of 105 household surveyed 73 (69.5 %) owned a house and 32 (30.5%) do not own a house. The findings also show the increasing pattern as compared to 2011/12 BHS which revealed that in overall 76 percent of Tanzanian households own the house they live in where ownership of dwelling being 58 percent in other urban areas and 37 percent in Dar es Salaam (BHS, 2011). Moreover, the survey result shows that households own different kinds of other assets as in Table 4.7.

Table 4.7: Assets Ownership

Asset	Household surveyed	Number of households owning an asset	Percentage (%)
Television set	105	87	82.9
Refrigerator	105	32	30.5
Radio	105	101	96.2
Electric iron	105	57	54.3
Bicycle	105	66	62.9
Motor cycle	105	32	30.4
Car	105	22	21.0
Mobile phone	105	102	97.1
Livestock	105	59	56.2

Source: Survey Data, 2016

The findings revealed that majority of households own mobile phones, radio and television set. As compared to 2011/12, there is increasing pattern in mobile phone ownership since about 78 percent of household where owning phones in urban areas in 2011 (HBS, 2011).

4.1.3.3 Income of Household

Income is one of the most important factors that affect most human social and economic decisions. Household education spending can be influenced by economic cycle (Pôle de Dakar, 2012). For instance, during recession household may under invest in education. The estimate of average income for the household under study shows the average income of household is 1,076,715.94TSh which is equivalent to average per capita income of 215,343.2TSh per household. This reveals that all households under study in Sumbawanga Municipal council had an average per capita income less than the national per capita income amount of 770,000TSh (URT, 2010). However, the study shows that income poverty is higher in household headed by female than in household headed by male (Table 4.8). The surveyed per capita income in Sumbawanga municipal council is the signal of income poverty in Rukwa region.

Table 4.8: Average per capita income

Type of household	Minimum income	Maximum income	Average income	Average per capita income
All households	50,000/=	11,200,000/=	1,076,716	215,343/=
Household headed by Male	50,000/=	11,200,000/=	1,118,170/=	223, 634/=
Household headed by female	50,000/=	1,750,000/=	682, 900/=	136,580/=

Source: Survey Data, (2016)

4.1.4 Child characteristics

To make a though comparison in determinants of education among household having children in both public and private schools, household head was asked to give the number, sex and type of the school in which the child/ children were studying. The findings revealed that on average, each household under the study on

average consists of approximately two children studying in secondary school (see Table 4. 9)

Table 4.9: Average Number of Children in Secondary School

Item	Minimum	Maximum	Average
Number of children in secondary school	1	4	2
Number of boys in secondary school	0	3	1
Number of girls in secondary school	0	2	1

Source: Survey Data (2016)

In terms of number of children studying in secondary schools, the findings as shown in Table 4.9 reveal that, on average each surveyed household consist of 1 girl or 1 boy studying in either private or public secondary school. Moreover, the ratio of number of girls and boys who are studying does not differ much. The study reveals that on average the proportional number of boys and girls per total number of students in the household are 0.51 and 0.49 respectively.

Table 4.10: Number of Children in Schools by Gender

Number of children	Boys		Girls	
	Frequency	Percentage (%)	Frequency	Percentage (%)
0	41	39.1	41	39.1
1	48	45.7	54	51.4
2	15	14.3	10	9.5
3	1	0.9	0	0
Total	105	100	105	100

Source: Survey Data (2016)

With regard to the type of the school, the findings reveal that out of 105 household surveyed, 33 (31.4%) their children studies in private schools only, 67 (63.8%) in public schools only and 5 (4.8%) in both private and public schools. Regarding the sex of the students, the findings reveal that out of 33 children who are in private schools 13 (41.1%) are girls and 20 (58.9%) are boys. Out of 67 children who are in public schools 36 (52.7%) are girl and 31 (47.3%) are boys (Table 4.11).

Table 4.11: Number of Children by Type of School

Type of school	Public schools			Private schools		
Sex of students	Boys	Girls	Total	Boys	Girls	Total
Number of students	31	36	67	20	13	33
Percentage	47.3%	52.7%	100%	58.9%	41.1%	100%

Source: Survey Data (2016)

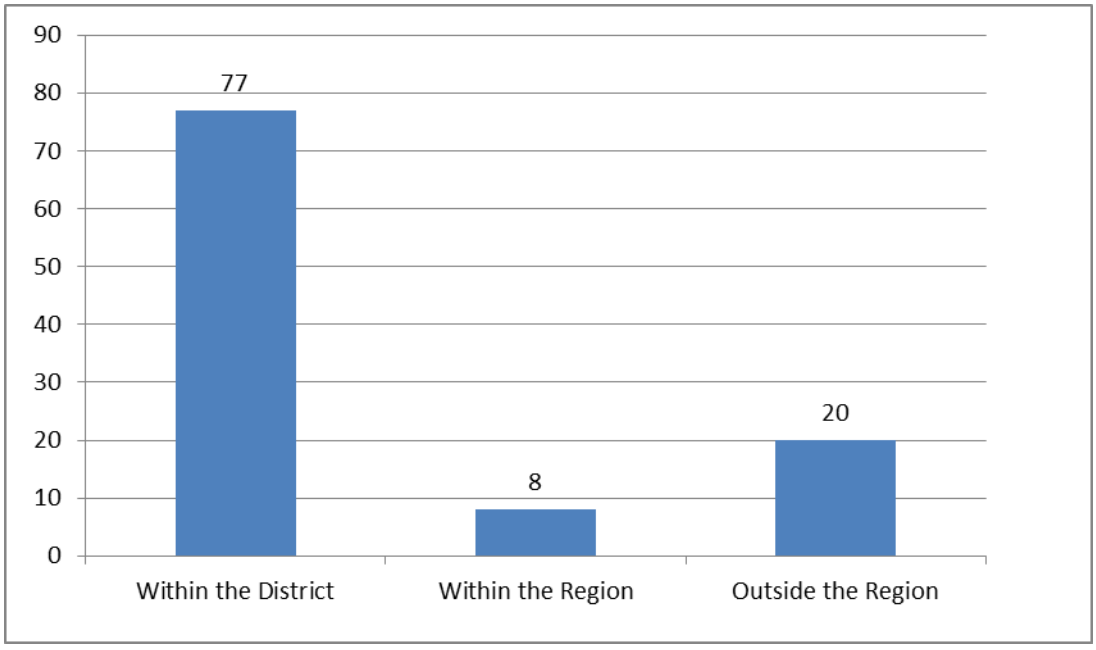
The findings in Table 4.11 show that in the area under study, household heads prefer sending more girls in public schools and more boys in private schools.

4.1.5 School Characteristics

The location of the school is also considered as important determinant of education spending among households. The availability of school within their surroundings reduces the amount of educational spending through reduced transport cost. The locations of the schools were divided in three categories.

The categories consist of students who study within the districts, within the region and those who study outside the region. The findings reveal that out of 105 students surveyed, 77 (73.3%) study within the districts, 8 (7.6%) in the region and 20 (19 %) study outside the region as shown in Figure 4.4.

Figure 4.4 School Locations in the Area



Source: Survey Data, 2016

The survey reveals that many household head send their children in schools within their ward. This is due to the availability of secondary schools in each ward as a

result of SEDP. Moreover, the study reveals that, households send their children to ward school so that they reduce their expenditure on education.

4.2. Improvement of Quality of education

Most parents plan to provide their children with best possible education environment. Their decision to spend in their children education depends on social, cultural and economic factors. The study was interested analysing the views of respondents on their willingness to spend towards quality improvement of education. The views of household head are presented in table 4.12.

Table 4.12: Willingness to Spend to Improve Quality of Education

Suggestions	Frequency	Percentage (%)
Not willing to spend more	6	5.7
Willing to spend more	67	63.8
Willing to spend the same	32	30.5
Willing to spend less	0	0
Total	105	100

Source: Survey Data (2016)

The results reveal that out of 105 household head surveyed, 6 (5.7%) households are not willing to spend more in order to get a better quality education, while 67 (63.8%) households are willing to increase their expenditure so as to get quality education and 32 (30.5%) are willing to spend the same amount. This implies that many households are willing to increase their expenditure if they are sure of their children in getting a better quality education. The survey shows that parents are after quality education so that their children will be innovative and able to compete for available employment opportunities.

The study also was interested in seeing if respondents get more opportunities (eg. increase of money) would be willing to send their children in the same school. The findings revealed at least 50.9% of households are not willing to send their children to the same school when there is increase of their opportunities. The results are shown in Table 4.13.

Table 4.13: Willingness of Household to Send Children to the Same School

Suggestion	Frequency	Percentage (%)
Not willing to send children to the same school	56	53.3%
Willing to send children to same school	49	46.7%
Total	105	100

Source: Survey Data (2016)

The results in Table 4.13 show that many household are not willing to send their children to same school when they get more opportunities. This reveals that parents are forced to send their children to a particular school by the availability of resources owned by household. Available resources contribute to the increase of household income. As the income of household increased the level of expenditure on education also increased other factors being constant.

To solicit on the expenditure of child of opposite sex, the household was asked to give their suggestions if they would have increased their expenditure if the child was of opposite sex. The findings are shown on Table 4.14.

Table 4.14: Willingness of Household to Spend to a Child of Different Sex

Suggestions	Frequency	Percentage (%)
I would spent less amount	10	9.5
I would spent the same amount	72	68.6
I would have spent more amount	23	21.9
Total	105	100

Source: Survey Data (2016)

The results from Table 4.14 show that many household are willing to spend the same amount regardless the sex of the child. With regard to reasons to their suggestions, household heads were asked to give the reasons for their decisions. The findings are shown in Table 4.15. The results reveal that in the area of study, sex of the students does not determine the level of expenditure of many household. All children have equal chances of spending in education by using the available resources in the household.

Table 4.15: Reasons for Expenditure on a Child of Different Sex

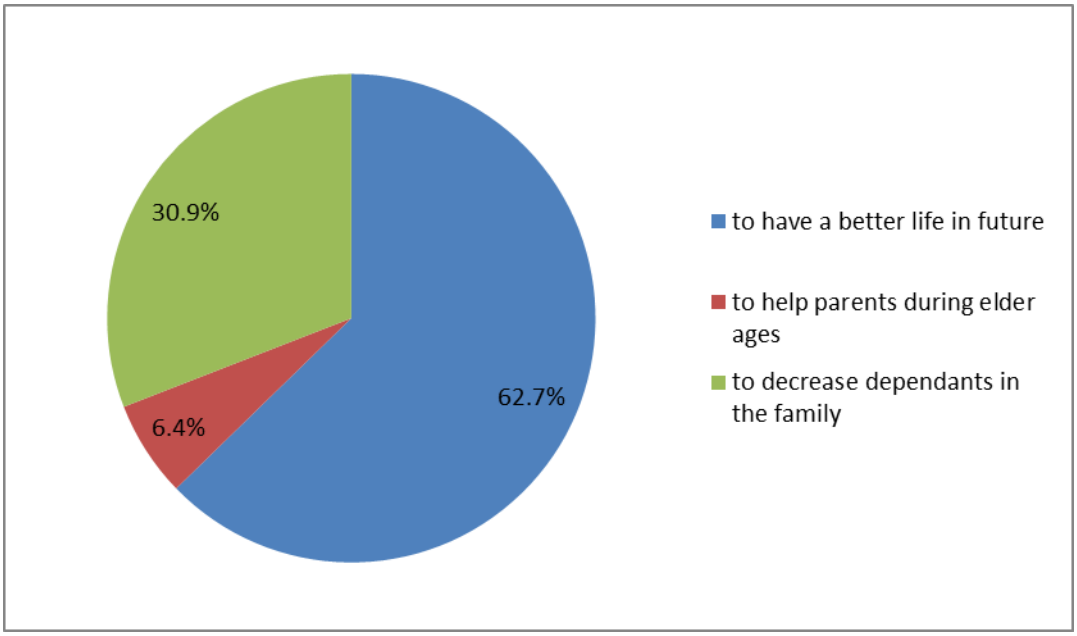
Suggestions	Frequency	Percent (%)
All children are equal	70	66.7
Boys require more costs than girls	9	8.5
Girls require more costs than boys	26	24.7
Total	**105**	**100**

Source: Survey Data (2016)

4.2.1 Expectation of Household from Sending Children to Secondary School

Households have different expectations from sending their children to secondary school. To solicit expectations of the household from sending their children to school, household head were asked an open ended question on what they expect in future after sending children to secondary school. Their suggestions are a presented in Figure 4.5.

Figure 4.5: Expectations of Household from Sending Children to Secondary School



Source: Survey Data (2016)

The findings from Figure 4.5 revealed that many parents educate their children so that their children will have better life chances in future. Few household are

expecting the help from the children after completing their education. Moreover, the findings reveal that, households send their children to secondary school with the aim of reducing the number of dependants in the family. They expect their children to be self employed or employed in government or private institutions after completing studies. The finding from female headed household with girls children reveal that they expect their girls to stop depending in men after being educated. Out of 8 women household heads having girls in secondary schools, 5 (62.5%) showed their concern in sending their girls to school so as to fight against women dependency to men.

4.3 Household Views on the Cost of Education

To solicit suggestions to lower the cost of education among household, household heads were asked an open ended question on what the government should do to reduce expenses in education. Their views are a presented in Table 4.16.

Table 4.16: Household Views on Strategies to Lower the Costs of Education

Suggestions	Frequency	Percentage (%)
Give subsidies to private schools	19	18
Increase salary and allowance to public school teachers	20	19
Improve teaching and learning environment in public schools	34	32.4
Provide support to poor families	15	14.2
Put grades/standards in private school fees	8	7.6
Remove school fees for 'A' level education	9	8.6
Total	105	100

Source: Survey Data (2016).

The findings in Table 4.16 reveal that when there is improvement of teaching and learning environment in public schools, many households that are sending their children to private school will send them to public school. The study revealed that, large number of children in public school which is accompanied by inadequate infrastructures is the major reason as to why many household heads decide to incur more cost in sending their children to private schools.

4.4 Econometrics Analysis of the Determinants of Household Spending in Education

This section presents inferential analysis of education expenditure. It covers the procedure used and findings obtained in analysis of determinants of household spending in education. The purpose is to determine the kinds of variables which influence household education spending in each specific objective. Moreover, this section presents the results of each hypothesis tested in the study.

4.4.1 Determinants of Non Fee and Total per capita expenditure on education

The study used OLS based multiple regression analysis applying OLS to estimate the coefficients of the determinants of non-fee per capita expenditure and total per capita expenditure among households. Table 4.21 presents the results of OLS regressions. Before the analysis of results, the study tested the linear regression assumptions including multicollinearity, heteroscedasticity, specification error and the overall model fit. Any violation of the above assumption might lead to estimating spurious results.

4.4.1.1 Multicollinearity Test

Multicollinearity refers to the existence of a perfect or exact, linear relationship among some or all explanatory variables of a regression model (Gujarati, 2004). When the model with Multicollinearity problem estimated, estimated parameters and standard errors are affected. Parameters estimates will be unstable and result in unexpected wrong sign for regression coefficient, despite that it is unbiased (Endrein, 2007). With perfect Multicollinearity it is not possible to obtain any estimate of the parameters, the model will simply collapse.

Multicollinearity test was done by using Variance Inflation Factor (VIF). $VIF_j = \frac{1}{1-R^2 j}$ where R^2_j is the coefficient of determination of the model which includes all explanatory variables except j^{th} variable. The usual rule of thumb is that

any variable with VIF greater than 10 indicates the Multicollinearity problem. The problem was reduced either by transforming variables or dropping a variable which is neither significance nor theoretical, neither valid nor likely to cause omitted variable bias (Gujarat, 2004). Moreover, for each qualitative explanatory variable used in this study the number of dummy variable introduced was one less than the number of categorical variables to avoid falling into the dummy variable trap.

Results for the multicollinearity test show that there was no serious multicollinearity since all variable had no VIF greater than 10 as presented in Table 4.17. This served as an assurance that estimates of coefficient did not suffer from the problem

Table 4.17: Results of Multicollinerity Test

Variable	VIF
Household head characteristics	
Dsex	2.71
Dmarit	2.58
Dedu2	1.45
Dedu3	1.29
Dsect	1.26
Dedu 5	1.25
Inage	1.08
Household characteristics	
Tnop	1.17
Dhous	1.14
Ln INC	1.10
ACR LAND	1.09
School characteristics	
Dtype1	6.24
Dtype2	5.63
DlocD	3.17
DlocOR	2.99
Student characteristics	
PrGirls	1.01
Tchild	1.01

Source: Stata output results (2016)

4.4.1.2 Heteroscedasticity Test

One assumption of CLRM is that the error term in the regression has common variance that is homoscedasticity. If the homoscedasticity assumption is not satisfied, the probability distribution of error variable is dependent on value of

explanatory variables. As a result, the variance of error term increases or decreases with the value of explanatory variable. This problem is called heteroscedasticity. Among the causes of the problem is the presence of a wide range of the size of explanatory variables of interest for instance higher variations in income. Estimating the model with heteroscedasticity problem, results in biased and inconsistent standard errors of the estimated parameters (Endrein, 2007). Therefore, the test of hypothesis will be no longer valid since the standard errors are wrong.

Heteroscedasticity is common in cross-sectional research (Gujarat, 2004), it was important to test in this study. The first regression was carried out on the assumption that there is no heteroscedasticity by using semi-log equation of the expenditure function. Post-mortem examination using Breusch Pagan test (**estat hettest**) was carried out to determine the presence of heteroscedasticity. Logarithm transformation of all variables is recommended in the OLS regression analysis when there is heteroscedasticity problem (Gujarat, 2004). Therefore, logarithm transformation for all numerical variables was carried out in the presence of heteroscedasticity problem. Furthermore, standard errors were adjusted for heteroscedasticity by making them robust standard errors to clear any problem which is associated with the presence of heteroscedasticity. The Breush Pagan test does not work after applying robust standard errors. Therefore, the study applied White Test **(estat imtest, white**) to confirm if the homoscedasticity assumption is satisfied. The null hypothesis is homoscedasticity. The results are presented in Table 4.18

Table 4.18: Results of Heteroscedasticity Test

Variables	Non fee expenditure per child	Total expenditure per child
	Prob > F	Prob > F
Household head characteristics	0.9775	0.2224
Household characteristic	0.4221	0.5344
School characteristics	0.9369	0.1230
Child characteristics	0.3159	0.4970

Source: Stata output results (2016)

The results in Table 4.18 shows that heteroscedasticity does not appear to exist since null hypothesis cannot be rejected at any reasonable level of significance

4.4.1.3 Specification Error Test

Ramsey Reset Test (regression Equation Specification Error Test) was utilised to test if the model has omitted variables. The test was done by typing the command " **estat ovtest**" after running regression on the STATA. The null hypothesis is that the model has no omitted variables. Rejection of null hypothesis implies that there are possible missing variables and the model suffers from endogenity, causing biased coefficient estimates (Andren, 2007). The results presented in Table 4.19 show that null hypotheses cannot be rejected at any reasonable level of significance. This implies that the model is correctly specified.

Table 4.19: Results of Model Specification Error Test

Variables	Non fee expenditure per child	Total expenditure per child
	Prob > F	Prob > F
Household head characteristics	0.4759	0.7951
Household characteristic	0.6434	0.1077
School characteristics	0.6309	0.9550
Child characteristics	0.9398	0.4148

Source: Stata output results (2016)

4.4.1.4 Model Fits test

F- test was used to test the overall fitness of the model. This attempted to test whether explanatory variables have joint effect on dependent variables. F- test compares the values of all slope coefficients simultaneously.

$$F = \frac{ESS/df}{RSS/df} = \frac{ESS/(k-1)}{RSS/(n-k)}$$

ESS = Error sum square

RSS = Regression sum square

Df = degrees of freedom

n = number of observation

k= number of parameters

Given the n-variable regression Model

$$Y_i = \beta_i + \beta_2 X_{2i} + \beta_3 x_{2i} + \ldots\ldots + \beta_n x_{ni} + \mu_i,$$

$$Ho: B_2 = B_3 = \ldots = B_n = 0$$

H_1: Not all slope coefficients are simultaneously zero

Decision rule is that if P value of F is low, one can reject Ho

The null hypothesis is that all slopes coefficient are simultaneously zero. Since the results in Table 4.20 shows that Prob> F is small in all variables, null hypothesis cannot be rejected. This implies that explanatory variables have overall joint effects on dependent variables.

Table 4.20: Results of the Model Fit Test

Variables	Non fee expenditure per child		Total expenditure per child	
	Prob>F	**R square**	**Prob>F**	**R square**
Household head characteristics	0.0000	0.2119	0.0000	0.2708
Household characteristic	0.0000	0.3089	0.0008	0.1048
School characteristics	0.0000	0.6024	0.0002	0.1669
Child characteristics	0.0015	0.2042	0.0012	0.0327

Source: Stata output results (2016)

Moreover, the R squares is 0.21 for non- fee expenditure equation and 0.27 for total expenditure equation. This suggests that 21% and 27% of the total variation in the non fee expenditure and total expenditure are due to the household head characteristics used in the study, respectively. Similarly, 31% and 10% of total variations are explained by household characteristics used in the study for non-fee and total expenditure, respectively. For school characteristics, the values of R squares show that 60% and 17% of total variation of household expenditure on non-fee and total expenditure, respectively, are explained by school characteristics. Furthermore, 20% and 3% of variations in non fee and total expenditure are explained by child characteristics used in the study, respectively.

Table 4.21: Determinants of Household in Education

Variable	Non fee expenditure per child		Total per capita expenditure	
Household head characteristics				
	Coefficient	Robust std Error	Coefficient	Robust std Error
DSex (male)	-0.495*	0.184	-0.784**	0.262
LnAge	-0.2581	0.334	0.614	0.459
Agesq	-0.0004	0.0006	-0.001*	0.0008
Dedu2 (primary level)	0.081	0.201	0.329	0.246
Dedu3 (secondary level)	0.585**	0.203	1.002**	0.261
Dedu4 (college level)	0.604***	0.149	1.323***	0.216
Dedu 5(university level)	0.798***	0.157	1.741***	0.225
Marital status (married)	0.770***	0.157	0.928***	0.207
Dsect	0.266*	0,142	0.155	0.245
Constant	12.518***	1.290	9.189***	1.803
Household characteristics				
Ln Household size	-0.293	0.231	0.061	0.283
Acres of land	0.007	0.005	0.016**	0.008
Ln Income	0.192**	0.076	0.554***	0.084
Dhouse (own a house)	0.165	0.157	0.246	0.200
Constant	9.839***	1.008	4.983***	1.170
School characteristic				
Dlocd (District)	-0.382*	0.173	-0.798**	0.225
Dlocor (outside region)	0.215	0.196	-0.006	0.208
Dtype1 (government)	0.273	0.219	-0.850***	0.158
Dtype2 (Private)	0.454***	0.225	0.379***	0.164
Constant	12.286***	0.256	13.793***	0.205
Child characteristic				
Total students	-0.146	0.087	0.078	0.136
Proportionate (Girls)	-0.168	0.159	-0.391*	0.225
Constant	12.663***	0.198	12.864***	0.271
Observation	105		105	

***Significant at 1%, **Significant at 5%, *Significance at 10%

The results in Table 4.21 show that the sex of household is significant determinant of household spending in education, both in non-fee and total expenditures. The coefficient of sex of household is negative and significance at the 10% and 5% levels of significance, respectively. Moreover, the study shows that the average expenditure of household headed by male is lesser by 0.495 and 0.784 in non-fee and total per capita educational spending, respectively, as compared to household headed by female, ceteris peribus.

The coefficients of the age of the household head are positive for total per capita expenditure and negative for non-fee per capita spending. In both cases the age of household age is not significantly different from zero. The findings reveal that as the

age of the household head increases by 1% on average, the total per capita expenditure on education increases by 0.6%. Moreover, the results show that as the household age increases by 1% on average, the total expenditure on non-fees decreases by 0.3% per child, ceteris peribus. With regards to total per capita expenditure more analysis was made by introducing the affect of Age square. The study reveals that, the Age Square of the household head is statistically significant at 10% level of significant with negative coefficient. This implies that the educational expenditure increases as the age of the household increases but at the decreasing rate. The findings show that the increasing rate reaches its peak when a household under study is 50 years, ceteris peribus.

The effect of levels education of the household head was analysed from non-formal to university level by using dummy variables. The results show a meaningful pattern in their influence on household expenditure on education. The findings reveal that levels of education are statistically significant determinant of household spending in both non-fee and total per capita expenditure on education. By comparing to non-formal level of education, the pattern of expenditure on both non- fees and total fees shows that spending increases with the level of education of household head as shown in Table 4.22.

Table 4.22: Educational Spending by Level of Education of Household Head

Education level	Non fees per capita expenditure (%)	Significant level	Total per capita expenditure (%)	Significant level
Primary	8.1%		32.9%	
Secondary	58.5%	5%	100.2%	1%
College	60.4%	1%	132.3%	1%
University	79.8%	1%	174.1%	1%

Source: Research findings (2016)

The results in Table 4.22 show that, household head with secondary education spent 50.4% and 67.3% more on non fee and total, respectively, than those with primary level. Moreover, household head with college level spent 1.9% and 32.1% on non-fee and total respectively more than those with secondary level. Household with university level spends 1.4% and 41.8 % more than those with college education in non fee and total respectively, ceteris peribus. With the exception of primary

education level several of other educational dummies are statistically significant with positive coefficients.

This is an indication that the level of education influences household education spending in both non fee and total. Therefore, the level of spending in education is directly proportional to the level of education of the household head. Keeping other factors constant, households with better educated heads are likely to invest more on education for their children in the area of study.

With regard to marital status of the household head, the coefficients of the married households are positive. The study shows that marital status of the household head is statistically significant determinant of household spending in education at the 1% level of significance to both categories of educational expenditure. In comparing the level of spending, the findings suggest that married household head spent 77% more than unmarried household head for non fee items. Moreover, the study shows that married household head spent 92.8% more than unmarried household in total per capita expenditure on education, ceteris peribus.

Sector of occupation of the household head with government or private sector is indicated by a dummy variable. The study shows that sector of occupation is statistically significant at the 10% level of significance determinant of non fee educational expenditure with positive sign. However, with regard to total per capita expenditure, the findings suggest that the sector of occupation of the household head is not statistically significant with positive coefficient. The study shows that household who work in government sector spends more by 15% in total per capita household and 27% in non-fee per capita expenditure as compared to their private counterparts, ceteris peribus. The findings imply that households that work in the government sector have a larger positive impact on education expenditure to their children as compared to those that work in the private sectors in the area of study.

The findings show that the size of the household is not statistically significant in both non fee and total household expenditure per child. Moreover, the results show expenditure on non-fee items is inversely related the size of the household. One unit increase in the number of households reduces the non- fee expenditure by 0.3units, ceteris peribus. However, the study reveals that total household expenditure per child is directly related with the size of the household. One unit increase of the household size, increases the total expenditure by 0.1 units per child, ceteris peribus.

Household income is positively correlated with both non fee and total education expenditure per child. The finding shows that the coefficient on non fee is statistically significant at the 5% level and 1% level of significance for total expenditure per child. Educational expenditure and annual income are in natural logarithmic form therefore coefficients on household income can be interpreted as the income elasticity of demand of education. The estimated coefficients are 0.192 and 0.554 for non fee and total fee expenditure per child respectively. This suggests that, a percentage increase in income on average leads to an increase of expenditure on non fee by about 0.2 percent; and on total household spending by about 0.6 percent, ceteris peribus. This implies that household expenditure on education is less elastic to change in household income in both non-fee and total. Since income elasticity is positive in both non fee and total expenditure education is a normal good in the area of study.

With regard to the ownership of the land, the results show a positive sign coefficient for both non-fee and total education expenditure. However, the study reveals that the variable is statistically significant at the 5% level of significance for total education expenditure. Moreover, an increase in the size of land by one acre of land on average will lead to a 0.7 units increase in non-fee expenditure and 1.6 units in total expenditure, ceteris peribus.

The effect of household ownership of a house was captured by the use of dummy variable. The findings reveal that household who own a house on average spends more by about 16% for non-fee items and 25% more for total expenditure per child

as compared to household that does not own a house, ceteris peribus. However, though the coefficients have positive sign, they are not statistically significant.

The location of the school was analysed from district level to outside region indicated by dummy variables. The study confirms that schools which are located in the district are negatively statistically significant at the 10% and 5% levels of significance for both non-fee and total education expenditure, respectively.

This suggest that household with students in schools located in their districts spend less as compared to other districts in the region. The study reveals that, other factors being constant, households who send children in schools located in their district on average spend less by 38.2% in non-fee and 79.8% in total as compared to those who send their children in different districts within the same region. The study also shows that the school being located outside the region is not statistically significant determinant of household educational spending. However, on average households who send children outside region spends 21.5% more in non fee items and 0.6% less in total expenditure per child compared to household who send their children in schools located within the region, ceteris peribus. The results imply that, other factors being constant, the presence or absence of school within the district is an important factor in terms of statistical significance or in terms of the value of the coefficient in education spending.

The type of school in which household enroll their children was analysed by using dummy variables. For the purpose of this study three categories were used that is public, private and both public and private. The findings show that enrolment of student in a public school is negatively significant at the 1% level of significance in total expenditure per child. Moreover, the results show household with children in public schools spends about 85% less as compared to household with children in public and private school, ceteris peribus. The coefficients of students enrolled in private schools are positive and statistically significant at the1% level of significance. Household with a child in private school spends more by 45.5% in

Non-fee items and 37.9% in total per a child as compared to household with children in public and private schools, ceteris peribus.

Total number of students in the household is not a significant variable in household spending. The study reveals that a constant proportionate change in expenditure on a given absolute change in the number of students in the household is – 0.146 for non fee and 0.078 in total education expenditure per child. This shows that the expenditure decreases at the rate of 14.6% for non fee items but increases at the rate of 7.8 % in total for a unit change in the number of students in the household, ceteris peribus.

This implies that as the number of students increase, households shift expenditure on non-fee to other items such as school fees, other factors being constant. Regarding the sex of a student in the household, the study findings show that education expenditure per child decreases by 16.8% on non fee items and 39.1% in total as the proportionate number of girls increased in the household as compared to boys, ceteris peribus. However, the study analysis reveals that the proportionate number of girls in the household is statistically significant at the 10% level of significance in total expenditure.

4.4.2 Determinants of per capita Fee Expenditure

Some of the households did not pay Fee items due to lack of income and/or abolishen of fees in public schools. OLS method assumes that the dependent variable is normally distributed. Zero fee expenditures violate the OLS assumptions leading to biased and inconsistent regression results. Therefore, analysis of per capita Fee expenditure by using OLS method is not appropriate. Instead the study adopted Tobit model. Table 4.25 presents the results of Tobit regression.

4.4.2.1Tobit Specification Test

According to Woodridge (2009) the Tobit model relies crucially on normality and homoscedasticity in the underlying latent model. Thus if any of the assumptions stated fail it is hard to know what Tobit is estimating. Therefore, to reduce heteroscedasticity, household fee expenditure was transformed into logarithmic form. However, since there is large number of households with zero expenditure, a value of one was assigned in the place of the zero fee expenditure. This is in line with Tansel and Bircan (2004) and Quang (2012).

To assure the consistent estimates in the Tobit model (homoscedasticity and normality of the disturbance term) Lagrange Multiplier (LM – statistic) in the bctobit Stata command was used to test the Tobit assumptions if they are compatible with the data. The critical values are not calculated from tables rather by bootstrap technique. The critical values are found from the bootstrap null distribution of LM test statistic by repeating the sampling from the parametric bootstrap Data Generating Process. When LM value is less than the bootstrap critical values at all levels of significance the model is correctly specified. The results of LM statistics results are shown in Table 4.23.

Table 4.23 Specification test for Tobit Model

Variables	LM	Bootstrap critical value		
		1%	5%	10%
Household head characteristics	0.917	13.6477	4.8009	3.6992
Household characteristics	0.483	19.63	6.60342	3.6034
Child characteristics	2.710	12.2931	6.2454	3.6933
School characteristics	1.764	11.5231	5.8961	3.6564

Source: researcher's computation (2016)

The results of LM statistic tests are less than the bootstrap critical values at all levels of significance. The results imply that the null hypothesis cannot be rejected. Therefore, the model is correctly specified and hence no Tobit assumptions are violated.

Regarding the fitness of the model, the goodness of fit was measured by Pseudo likelihood ratio and p-values

Table 4.24: Goodness of fit of Tobit Model

Variables	P- value	Pseudo R^2
Household head characteristics	0.0000	0.0469
Household characteristics	0.0000	0.0539
Child characteristics	0.0009	0.0129
School characteristics	0.0000	0.0807

Source: Stata output (2016)

The results shown in Table 4.24 suggest that the model fits the data reasonably well.

Table 4.25: Determinants of per capita Fee Expenditure

Variable	**Fee Expenditure per Child**		
Household head characteristics			
	Coefficient	Robust std error	Marginal effects (dydx)
DSex (Male)	-12.716***	3.112	-6.336***
Age	2.276**	0.470	1.134**
Age square	-0.025**	0.005	-0.012**
Dedu2 (Primary)	-8.508**	3.317	-4.238**
Dedu3 (Secondary)	-2.537	3.090	-1.264
Dedu4 (college)	-2.573	2.701	-1.282
Dedu5 (university)	2.333	3.495	1.162
DMarit (married)	15.925***	3.495	7.934***
DSector(Public)	0.034	2.127	0.017
Constant	-45.955**	21.671	
Household characteristics			
Ln Household size	1.795	2.920	0.903
Acres of land	0.176*	2.374	0.089*
Ln Income	4.460***	0.092	2.446***
Dhouse (own a house)	2.192	0.979	1.103
Constant	-66.127***	16.145	
School characteristics			
Dlocd (District)	-7.756***	1.757	-4.091***
Dlocor (outside region	-0.812	1.523	-0.428
Dtype1 (government)	-7.378***	2.017	-3.891***
Dtype2 (Private)	-0.541	1.772	-0.286
Constant	15.505***	1.858	
Child characteristics			
Total students	3.142**	1.094	1.498**
Proportionate (Girls)	-3.104	2.431	-1.479
Constant	1.351	2.73	

***Significant at 1% **Significant at 5%, *Significance at 10%.

The results of the Tobit regression analysis (Table 4.25) show that sex of household is statistically significant at the 1% level of significance with negative coefficient. The sign of coefficient is similar to both non fee and total expenditure but with higher significance level. The findings reveal that household headed by male spends about 6 times less on fee education expenditure than those household headed by female

The age and age squared of household head are both statistically significance at the 5% level of significance with positive and negative signs respectively. The findings reveal that expenditure on fee is 1.134 times more as the age of household increase by 1 year. The findings reveal that household expenditure on fee is likely to peak when a household head is 48 years.

At this age the household head on average spends about 0.01 times less as the age increase by 1 year. The results reveal that household spending on fee increases with the age of the household head but at a decreasing rate.

Regarding the Level of education of the household head the coefficients of lower levels of education are negative. Contrary to non fee and total expenditure, household headed by primary level household is statistically significant at the 5% level of significance. The higher levels of education do not show the significant impact toward household decision in payment of fee. In terms of levels of education, household heads whose education levels are primary spends about 4 times less than those with non-formal education. Moreover, household heads with secondary or college levels spend about 1.3 times less than those with no formal levels. However, the findings reveal that household heads with university education spend about 1.2 times more than those with no formal level, other factors being constant.

The coefficient of the married households is positive and statistically significant at the 1% level of significance. This result corresponds to non fee and total household expenditure. Moreover, the findings reveal that married household heads spend about 8 times more in fee education expenditure than those unmarried household

head. The sector of occupation of the household head does not show a significant impact on household decision in payment of fees. However, the positive coefficient shows that household working in the government sector has a large positive impact on fee payment compared to those that works in the private sector. The marginal coefficient shows that a household heads working in public sector spend about 0.02 times more than those working in private sector.

The findings show that the size of the household is not statistically significant determinant of household fee education spending. However, the positive marginal coefficient show that the level of fee expenditure increases as the increase of number of people in the household. The study shows that on average the household spends about 0.9 times more in fees as the size of household increases.

Household income is positively related with the amount spent by household on fee. The findings reveal that the coefficient is statistically significant at the 1% level of significance. The results show that when there is unit increase of income, a household on average increase the level expenditure on fee by about 2 times more per student. A small increase in income among household leads to higher increase in the amount of fee to be paid. This implies that household expenditure on education is more elastic to change in household income.

With regard to the ownership of the land, the results show a positive sign coefficient. Moreover, the study reveals that the variable is statistically significant at the 10% level of significance. The findings show that households spend about 0.09 times more in fee when decide to increase 1 acre of land. This implies that those households owning large land are likely to spend more on fee.

The marginal coefficient of location of school in a district is negative. This shows that location of school in the district area is inversely related to amount of fee paid among households. The study confirms that schools which are located in the district are negatively statistically significant at the 1% level of significance. Moreover, the study shows that on average households who send their children in a school located

in their district spend about 4 times less than those with children in other districts. The study also shows that the schools located outside the region has no significant impact on amount spent in fees. However, the positive marginal coefficient shows that on average households who send a child outside region spend 0.4 times less than those with children within the region, other factors being constant.

The enrolment of student in a public school is negatively significant at the 1% level of significance. The study shows that households with children in public schools spend about 4 times less as compared to household with children in both public and private school. The coefficient of students enrolled in private schools is also negative with no significant impacts on decision of household spending. However, the marginal coefficient shows that households having children in private school only spend about 0.3 times less than households having children in both public and private schools.

The number of students in the family is statistically significance at the 5% level of significance with a positive sign. The findings show that household spends about 1.5 times more in fees as 1 student increase in the household. Furthermore, the findings show that the proportionate increase of number of girls has no significant impacts on household decision to pay fees. However, the negative marginal coefficient suggests that the increase of the proportionate number of girls in the household lead to about 1.5 times less expenditure on their fees.

CHAPTER FIVE

DISCUSSION OF THE FINDINGS

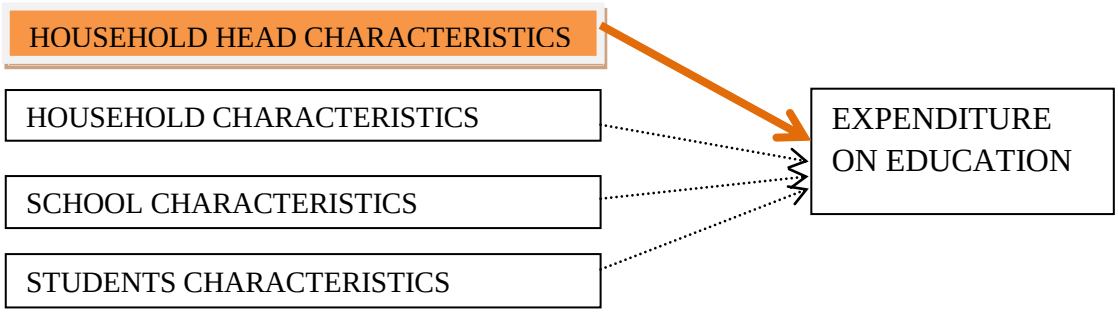
5.0 Introduction

This study examined the determinants of household spending in education in Sumbawanga municipal council. In this chapter we examine main findings obtained from data analysis with respect to the theories and empirical findings of the studies undertaken by other studies. The aim is to decide on the reliability of the theory and empirical studies undertaken by previous researchers in comparison to findings obtained from the current study.

5.1 Household head characteristics

In the analysis of the household head characteristics; age, sex, marital status, level of education and occupation status were used in assessing determinants of household education expenditure. This is in line with specific objective number 1 and hypotheses number 1a to 1e.

Figure 5.1: Household Head Characteristics and Education Expenditure



Source: Researcher's Own Design (2016)

The findings show that household headed by male spends less as compared household headed by female. The results are not in line with the prior expectation of the study. The prior expectation was household headed by male spends more than

household headed by female. Majority of male headed households are married category. The expectation is that they earn more income from both parents, other factors being constant.

The study also shows that households headed by male earn more income than households headed by female. Possibly, this suggests that female household heads views investment in education as the principle route out of poverty cycle as compared to male counterparty. Furthermore, the findings do not support the prior expectations of household production model that it is the attributes of both household members and household head that determine the allocation of resources in education. Possibly, the location of resources in education depends on dictatorship of the household head. However, the results support the empirical findings from the studies undertaken by Ogundari and Awudu (2014) who confirmed the significant impacts of sex of household head on household spending in education. Moreover, the findings are in line with results reported by Lloyd and Blank (1996) and Donkoh and Amikuzuno (2011) showing that female headed households tend to invest more in education of their children than male headed households in developing countries. Likewise, the results support the findings reported by Donkoh and Amikuzuno (2011) that high education expenditure as the result of high income in the household does not necessarily mean high probability of spending in education

As expected, marital status of the household head is positive and significantly predicting education spending among households. The results show that the married household heads are more likely to spend more in education than other marital status categories. Possibly, married household earn more income from both parents than a single parent. Rojas (2014) also provides support to the claim in the literature that marital status of household head has positive effects on household spending. Moreover, the findings are in line with household production model that the attributes of both household members and household head determine the allocation of resources in education. Therefore, household acts as one decision making unit in education expenditure.

When breaking the items to non fee, fee and total, the study show that Age and Age squared of household head are both statistically significance in fee items and total. The results reveal spending in both fee and total items increase with the age of the household head but at a decreasing rate.

The results support the prior expectation of the study. Prior expectations were positive and negative coefficient for age and age squares respectively. It is expected that household spend more for younger household head but as head grows old reduces spending. The results also are consistent with the study undertaken by Kim and Lee (2010), Sulaiman, Ismail and Othman (2012 and Andreous (2012). Moreover, the findings reveal that household expenditure is likely to peak when a household head is 48 and 50 years in fee and total respectively. Furthermore, the findings are reliable to the life – cycle expenditure pattern of the household head. Possibly, the results of this study confirm that younger household head understand the benefit of secondary education better than older counterparts, other factors being constant. When comparing the relationship among the items, the findings show that the level of spending on fees has positive correlation with the total household expenditure to younger household heads. However, for older household head the findings show that the level of spending on non-fee has a positive correlation with total household education expenditure.

The education level of household is important in education spending. Household head with primary education is significant determinant of household spending on fee, but the direction of the relationship effect is negative. This suggests that households with primary education are less likely to spend in fee items as compared to household with no formal education. The study further show that heads with higher levels of education (secondary, college and University) is statistically significant with positive signs in non fee items. Therefore, as expected the findings show that the increase in levels of education is directly related to expenditure on education. It is expected that well educated household head would be willing to spend more in education of children to take them to similar level. These results are

in line with Sulaiman, Ismail and Othman (2012) and Andreous (2012) who confirmed the significance of the variables. Education has been in use as indicator for development of human capital in human capital theory. Therefore, the results further support the prior expectation of human capital theory that human with higher human capital spends more in education.

The theory portrays that investment in education leads to individual economic growth. The results also imply that intergeneration educational mobility is low in the area of study. A low educated household heads spends less in education.

As the result lower educated household heads can have lower educated children. According to human capital theory, lower educated children will earn low income. Consequently spends less in education. Therefore, an individual can face difficulties to move outside the income class of the household. Possibly, well educated household heads are more aware of the benefits of education for their children and hence spend more on it. Furthermore, the results suggest the possible relationship among items in education expenditure. The level of expenditure on non fee has a strong power to bring the effects on total household spending when a household head possess primary, secondary or college levels of education. Moreover, level of expenditure on fees brings the significant effect in total household expenditure for household with college level of education.

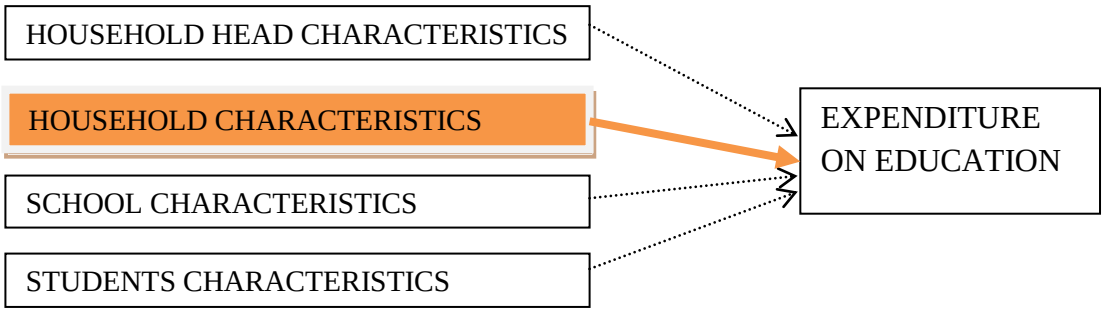
The working status of the household head is significant and positively predicting the household spending on education. The study shows that household headed by heads working in public sector spends more in education than those working in private sector. The results support the prior expectation of the study since the majority of household heads working in public sector are salaried s in the area of study. Smits, Rani and Huisman (2010) confirmed that household heads that are in salaried employees are more aware of the importance of education and hence investing more. In a similar way, Bayar and Ilhan (2016) confirmed that households whose household heads are wage workers spend more in education than the ones whose heads are unpaid workers. More closely related to this, findings from Treiman and

Ganzeboom (1990) shows that farmers and business owners feel less need to invest in their children's education than people in dependent employment. Moreover, the findings from this study are in line with the results reported by Sulaiman, Ismail and Othman (2012). The study also supports the prior expectation of human capital theory that employment status of human determines the returns that an individual receives from working. We expect that the returns from working received by household heads in public sector influences them in investing more in education of their children. For instance wage differences among household working in public sector possibly are the incentive to invest more in education of children, other factors being constant. However, the study also confirm that for household working in public sector, the level of spending on non-fee brings the significant effect to total educational spending.

5.2 Household Characteristics

In the analysis of the household characteristics; income, household size, house and land ownership were used in assessing determinants of household expenditure on education. This is in line with specific objective number 1 and hypotheses number 2a to 2d.

Figure 5.2: Household Characteristics and Education Expenditure



Source: Researcher's Own Design (2016)

The study confirmed that Income of the household is positively correlated with household spending. As expected, expenditure on education increases as the income

of households head increases. We expect that costs of education are not an obstacle of sending children to school for households earning higher income as compared to lower income households. For instance, costs on fees, uniforms, transport and learning materials. Possibly, higher income households spend more on education of their children than lower income households, other factors being constant. The finding further provides support to arguments in the literature that income has positive effects on household spending. For instance, the finding reported from Ogundari and Awudu (2014), Tilak (2002), Andreous (2012), Shafiq (2011), Sulaiman, Ismail and Othman (2012) and Ngwilizi (2013).

Moreover, the findings are in line with the expectation of household production function that household maximises utility from education subject to budget constraints. The level of utility of the household depends on the level of budget. The level of budget depends on real income of the household, other factors being constant. The results also show that income of the household brings the joint influence of levels of education expenditure on non-fee, fee and total.

Furthermore, the findings show that household spending on non-fee and in total is less elastic to changes in income, but more elastic in fee expenditure. The result suggests that educational expenditure on non-fee items is necessary in household budget. This result is in line with Tilak (2002). Fee is a luxurious item, showing that as income increases household tends to move children to more expensive schools. Higher income elasticity is possibly showing the quality of education. Therefore, the study confirms that a richer family spends more in education than poor family, other factors being constant.

The ownership of durable assets in the household is the sign of wealth. Regarding the ownership of the land, the results show the variable is statistically significant in fee and total education expenditure. As expected, the study reveals the positive relationship of the variable with household education expenditure. We expect that households with many durable assets such as land and houses earn more wealth which increases the level of consumption of the households in education.

The results are in line with the findings from Donkoh and Amikuzuno (2011) and Smits, Rani and Huisman (2010) who reported higher probability of spending in education for households owning land and houses. Likewise, Kim and Lee (2001) found that households that own houses spend more in tuition (private tutoring). Furthermore, the findings support the prior expectation life cycle hypothesis and household production function that expenditure is the function of both income and wealth. That is household expenditure depends on wealth and income levels which determine the household budget decision on education. Moreover, the study reveals that the level of expenditure on fees paid by a household owning land has strong effects on the total amount spent in education. This implies that households owning large land are likely to spend more in school fees. Possibly, the existences of larger land lead to higher household income from production activities and renting. This brings the ability of household to send children to more expensive schools, ceteris peribus.

Regarding the demographic burden of the household, the findings show that the size of the household is not statistically significant with both negative and positive relations. The results show expenditure on non-fee items is inversely related the size of the household. As the size of households increases, the level of spending on non-fee education expenditure is reduced.

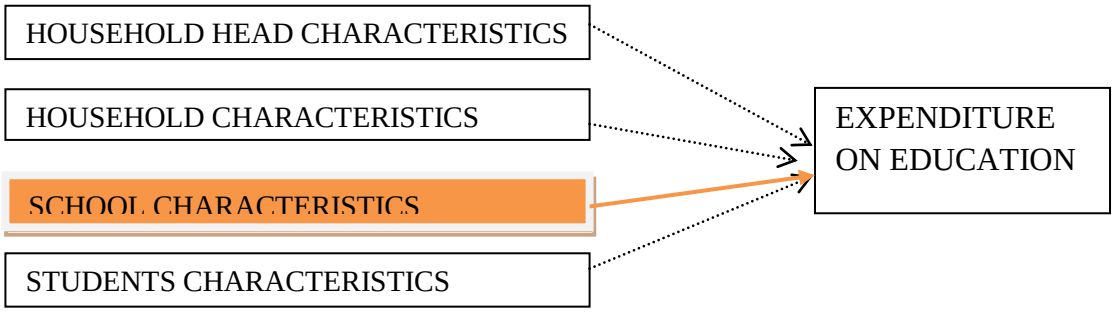
The results are not consistent with the study undertaken by Kambhampati (2008) and Choudhury (2011) that showed the number of siblings is directly related with non-fee expenditure on education. Moreover, Kim and Lee (2010) found that an increase in the number of children reduced private tutoring expenditure in Japan. The study also reveals that total household expenditure per child is directly related with the size of the household. Households with high demographic burden spend more in total education. The results support the empirical studies undertaken by Tilak (2002), Awudu and Ogundari (2014), Ngwilizi (2013) and Sulaiman, Ismail and Othman (2012). However, the study shows that the variable has no significant impact on decision toward household education spending. Possibly, the positive

impact of the household size variable on total expenditure is in line with the notion that the larger households are better off due to economies of scale that is built up from sharing public goods such as education per a given level of capital resources. Also, has positive effect on the allocation of extra resources to education through participation of household members in economic activities which may increase family budget, other factors being constant.

5.3 School Characteristics

In the analysis of the household characteristics; location and type of the school were used in assessing the determinants of household expenditure on education. This is in line with specific objective number 2 and hypotheses number 4a to 4b.

Figure 5.3: School Characteristics and Education Expenditure



Source: Researcher's Own Design (2016)

Regarding school characteristics the results show that a school located within a district has significant effects on decision to spend on non fee and fee and hence influencing total household spending. The findings are in line with the prior expectation of the study that households with children studying within the districts spend less in education than those with children outside the district. It is expected that the location of the school determines the distance of students to travel to school. Hence, locating the school near to households reduces transport costs, other factors being constant. The results are consistent with the results reported by Tilak (2002). This implies that the availability of schools in habitation reduces costs of education.

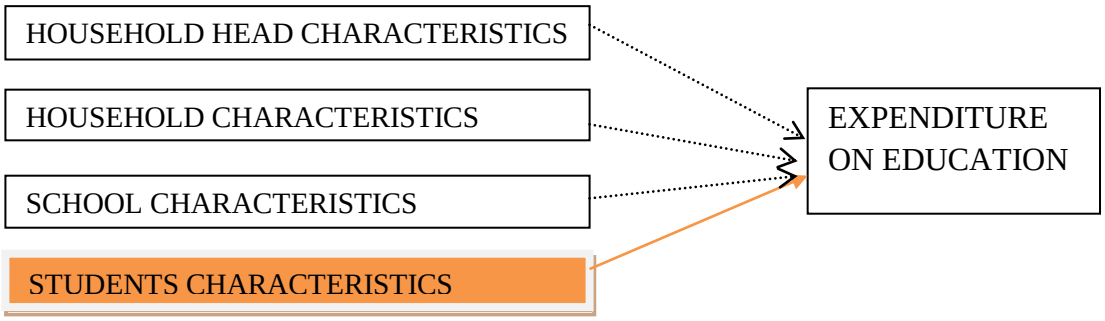
Therefore, it determine the access of education among household regardless their income levels, other factors being constant.

Furthermore, the results show that a government school have positive influence on the amount of fees paid by household but has a negative influence to total household spending. This implies that a school being owned by the government reduces total household expenditure on education. Possibly, other factors such as location of the school, teachers and learning environments determine the type of the school to enroll a child, other factors being constant. Moreover, as expected, the study reveals that a parent with children in private school spends more than those with children in public school. Fees and contributions have been eliminated in government school which reduces the level of household education expenditure. The results are in line with the findings from Tilak (2002) and Choudhury (2011). Moreover, Andreous (2012) confirmed that private sector school vary in quality and thus provide an opportunity for households to obtained the desired level of quality by paying different education fees. Possibly, private schools provide quality education which is the incentive to higher household education expenditure.

5.4 Student Characteristics

In the analysis of the student characteristics; proportionate number of girls and total number of students were used to assess the determinants of household expenditure on education. This is in line with specific objective number 3 and hypotheses number 3a to 3b.

Figure 5.4: Student Characteristics and Education Expenditure



Source: Researcher's Own Design (2016)

The findings show that the number of students in the family is statistically significant and positively correlated with household total education expenditure. The findings support the prior expectation of the study that the number of students in the family is positively influencing household education spending. It is expected that household may increase or decrease the level of spending to children depending on the available sources of income. If the income is related to the number of students then the household may increase the level of spending in education, other factors being constant. The results are in line with the findings from Quang (2012). However, the proportionate increase of number of girls has no significant impacts on household decision to spend on education. The study reveals that the proportionate increase of the number of girls leads to reduction of household spending in girl's education contrary to boys. They show that household spends less for girls than boys. The results support the empirical studies undertaken by Choudhury (2011).

In contrast, Kambhampati (2008) and Tansel (2002) found higher amount is spent to girls due to higher return to education as compared to boys. Moreover, Tilak (2002) does not show the difference in the expenditure between girls and boys. Possibly, this suggests that in the area of study household prefers the education of boys than girls. Basing on the arguments from some of household heads, this is due to notion that an educated girl brings more returns to her husband's family. This is the signal for gender discrimination in education.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND POLICY IMPLICATIONS

6.0 Introduction

This chapter briefly presents the summary of findings obtained from estimated results, the conclusions and policy recommendations necessary for improving the situation by policy makers and planners. Further, it presents areas of further research.

6.1 Summary of Findings

The aim of this study was to assess the socio-economic determinant of household education spending. Specifically, the study was guided by the following objectives; Firstly, to ascertain what kinds of the characteristics of the household and household head affect the level of household spending in education; secondly, to determine what kinds of the school specific characteristics affecting the level of household spending in education; and thirdly, to determine whether children characteristics influence the level of household spending in education.

The study used primary data collected through a cross-sectional survey of randomly selected households in Sumbawanga municipality. The study estimated three sets of regression equations, namely the equations for total household expenditure per student, fee expenditure per student and non- fee expenditure per student. In each set, equations are estimated separately by household head characteristics, household characteristics, school characteristics and student characteristics. OLS was used for estimation of non-fee and total expenditure while Tobit model was used for fee expenditure. Table 6.1 presents the summary of significance of the variables.

The findings of the study suggest that income of the household, sex and marital status of the household head and location of the school in the habitant are the key factors determining amount of household's expenditure on education in all items.

The study shows that income of the household is positively correlated with household spending. The income elasticity of total expenditure per student suggests that education is a normal good. It further suggests that education is a necessary and luxurious good in non-fee and fee expenditure, respectively. Moreover, the findings reveal that household headed by male spends less as compared to the household headed by female. The results show that the married households spend more in education as compared to their counterparts. The results also show that location of school in the district has negative influence on the household expenditure on education.

Regarding the individual expenditure source, age and age squared of household head are both statistically significance in fee and total expenditure, respectively. The results reveal that spending in both fee and total increase with the age of the household head but at a decreasing rate

Levels of education of the household head show a meaningful pattern in their influence on household expenditure on education. The findings reveal that levels of education are statistically significant determinants of household spending in education in both non-fee and total. By comparing to non-formal level of education, the pattern of expenditure in both non-fees and total fees shows that the level of spending increases as the level of education of household head increases. For household working in public sector, the amount spent on non-fee items dominates on the amount spent on total household expenditure. The results show that households headed by heads working in public sector spend more in education than those whose heads are working in private sector.

Furthermore, the results show that ownership of land is the determinant factor in household education spending. The findings reveal that the variable is statistically significant in both fee and total education expenditure. The findings also show that the size of the household is not statistically significant but positively correlated with fee and total education expenditure. It further shows that expenditure on non-fee items is inversely related the size of the household.

The study shows that the enrolment of student in government school is statistically significant determinant of household education spending in fee and total. The findings show that household with children in government school spend less as compared to those with children in both government and private schools. Furthermore, the study suggests that total household expenditure is strongly influenced by expenditure on non-fee items for private schools. The study shows that enrollment of students in private schools is the positive determinant of household education expenditure in both non-fee and total. However, household with students in private school spends more than those with students in both public and government school. Moreover, the study shows that the level of school fees has a strong power in decision to spend in total expenditure for a given number of students present in the household. Nevertheless, the findings confirmed that the proportionate number of girls in the household is inversely related to amount spent on them.

Table 6.1: Summary of Significance of Variables

Variable	Per capita education expenditure		
Household characteristics			
	Fee Expenditure	**Non fee Expenditure**	**Total expenditure**
DSex (Male)	***	*	**
Age	**		
Age square	**		***
Dedu2 (Primary)	**		
Dedu3 (Secondary)		**	***
Dedu4 (college)		***	
Dedu5 (university)		***	***
DMarit (married)	***	***	***
DSector(Public)		***	***
Household characteristics			
Ln Household size			
Acres of land	*		**
Ln Income	***	**	***
Dhouse (own a house)			
School characteristics			
Dlocd (District)	***	*	**
Dlocor (outside region)			
Dtype1 (government)	***		***
Dtype2 (Private)		***	***
Child characteristics			
Total students	**		
Proportionate (Girls)			*

***Significant at 1%, **Significant at 5%, *Significance at 10%

6.2 Conclusion

This study assessed the determinants of household education expenditure. The findings of the study show that the determinants of household education come from household head characteristics, household characteristics, school characteristics and/or child characteristics. Moreover, some determinants are basically on particular type of household expenditure. Three regressions reflect clearly how determinants of education differ among households. The removal of school fees may have helped children from lower income household to get education, however non fee expenditure and total expenditure have to be given weight. Social economic status of the household still determines the household expenditure pattern in education. These factors call attention to demand and supply for education. Intergenerational mobility calls upon all stakeholders in education to cooperate together in targeting poor households. Therefore, the findings from this study provide insight into achieving policy objectives of improving educational attainment and school quality in Tanzania.

6.3 Policy Implications

This part presents policy recommendations based on the important findings obtained of the study. The following policy options are recommended.

6.3.1Regarding Quality Improvement of Education

The findings of the study show that households are willing to pay more for the quality improvement of education. But public expenditure and household (private) expenditure complement each other. It is recommended that educational stakeholders should improve the quality of schools. The provision of teaching and learning materials, improvement of school infrastructures, better teacher training and payment of incentive to teachers are suggested to improve the quality of education. If the quality of education is improved and teachers are motivated, household might be also encouraged to spend more on the education of their children. This could help to improve the education status among households.

Since the area is lagging behind in education. The media should raise awareness campaign to public on the importance of quality education. Moreover, dialogue on quality education which involves education institutions, government and the community should be encouraged. This will help in assessing the component of quality education in meeting the needs of the society. Furthermore, the partnerships among educational stakeholders to advocate ICT centres are recommended so that teachers and students can have access to the internet services.

6.3.2 Regarding Income of the Household Head

The study shows that households who are better off spend more in education. It is recommended that policy should target poor households. Majority of poor households engage themselves in subsistence farming as the major occupation. Therefore the increase of subsidies scheme in improved seeds, fertilizers, insecticides and pesticides to poor peasants are suggested. Moreover, the provision of learning materials, free uniforms, subsidies and free schorships for children from poor families should be encouraged. Furthermore, the constructions of improved public secondary schools within the districts are recommended to reduce education expenditure among poor households. This could significantly improve education status of households.

The findings show that majority of households headed by female are earning low income. Low incomes of parents can results in failure of household in paying fees and buying non fee items. It is recommended to support poor women so as to raise their net income. Women allocate higher percent of their income to education. The policy supporting the income of majority of female household head who are poor will improve the education status of household and hence improve the performance of their children.

6.4 Limitations and Areas for Further Research

This study has some limitations and could not include all variables which could have significant impacts household spending in education. For instance, the study does not consider the characteristics of the spouse and student-teacher ratio. Moreover, the study concentrated on the urban centre of Sumbawanga Municipality with no comparison between urban and rural areas. Furthermore, in analysis the study took the general view with no consideration of an individual item. Therefore, having these limitations further research should be conducted to include among the outlined variables. It can further be conducted using other econometric techniques such as logit and double-hurdle models to investigate how these variables bring the impacts on household educational spending.

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APPENDICES

APPENDIX I

QUESTIONNAIRE

For Household with children at secondary schools

Dear Sir/Madam,

My name is Oscar Mpasa, a student of Mzumbe University pursuing master degree in Economics. I am conducting a study on Socio- economic Determinant of Education Spending in Sumbawanga Municipal in partial fulfilment of the requirement of the program.

I kindly request you to participate in my research. As one of the participants your opinions are very important to this study. I assure you that all information given will remain confidential and will only be used for the purpose of this study.

Thank you in advance for your co operation.

PART A: HOUSEHOLD HEAD CHARACTERISTICS.

Please put a mark (√) against the correct options.

A1 Sex: (1) Male ( ) (2) Female ( )

A 2 Age (in years) ……..**.....**

A 3 Level of Education

(1) None	(2)Primary	(3) Secondary	(4)College	(5)University

A4. If the answer in A4 above is 1 can you read and write?

(1) Yes ( ) (2) No ( )

A 5 Marital status

(1)Married	(2) Divorced	(3) widowed	(4) Separated

A 6 Major occupation

1)Farmer	2)Artisan/small business/petty shop	3)Salaried employee	4) Rentier	4)Domestic worker	6)Unemployed

A7. If the answer in A6 is 3, what is the Sector of Occupation?

(1) Government sector ( ) (2) Private sector ( )

A 8. Level of Education of a spouse

(1) none	(2)Primary	(3) Secondary	(4)College	(5)University

A9. Major occupation of a spouse

1)Farmer	2)Artisan/small business/petty shop	3)Salaried employee	4) Rentier	4)Domestic worker	6)Unemployed

A10.If the answer in A9 is 3, what is the sector of Occupation of your spouse?

(1) Government sector ( ) (2) Private sector ( )

PART B: HOUSEHOLD CHARACTERISTICS

B1. What is the total number of people living in your household? .....

B2. How many in B4 above are dependants? .....

B3. Do you own a house/ houses? (1) Yes ( ) (2) No ( )

B4.How many acres of land do household is holding? .....

B5. Please a tick (√) against any asset owned by your household

Asset	TV	Refrigerator	Radio	Electric iron	Bicycle	Motorcycle	Car	Livestock
Ownership								

B6. On average, how much does your household earn per month generated from various sources?

Source of income	Average income per Month (Tsh).
Salary	
Livestock keeping	
Farming activities	
House rent	
Commerce/trade	
Other sources	
TOTAL	

PART C: STUDENT CHARACTERISTICS

C1.Do you have any child/children studying in secondary school?

(1) Yes ( ) (2) No ( )

C2. If the answer is Yes in C1 above, how many children are in secondary school in terms of sex?

Sex	Number
Boys	
Girls	

C3. What is the position of the child in the family? (eg. First born, second born etc)

……

C4. Is/are student biological child/children of your family?

(1) Yes ( ) (2) No ( )

PART D: SCHOOL CHARACTERISTICS

D1. What is the type of the school in which child/children is/are studying?

(1) Government school ( ) (2) Private school ( )

(3) Both government and private ( )

D2. What is the location of the school from your household?

1)within district	2) within Region	3) Outside Region

D3. On average, what is the amount of money (Tsh) you spend to support your child/children in education per year?

ITEM	UNIFORMS	Skirts	Trousers	Shoes	Shirts	Sweater	T-shirt	Emblem	Shamba dress	Sports activities
AMOUNT										

ITEM	SCHOOL FEES	TUITIONS	TRANSPORT	LEARNING MATERIALS	Books	Exercise books	Models
AMOUNT							

TOTAL AMOUNT SPENT	

D4. If the quality of education is to improve, would you spend more in order to get better/ quality education for your child/children?

(a) I wouldn't spend more for better/quality education ( )

(b) I would spend the same amount regardless of the quality of education ( )

(c) I would increase my spending in education in order to get better/quality education. ( )

(d) I would spend less ( )

D5. If the child was of opposite sex, would have spent more than that amount?

(a) I would have spent less ( )

(b) I would have spent the same amount ( )

(c) I would have spent more ( )

Please, give reason/reasons for your answer:

……

……

……

……

……

D6. If you get more opportunities (eg more money etc) would you send your child to the same school?

(1) Yes ( ) (2) No ( )

D7.What does the household expect from sending a child to school?

……

……

……

D8. In your own view, what should the government do to reduce the cost of education?

……

……

THANK YOU

Appendix II

INTERVIEW SCHEDULE

1. What criteria do you consider to send your child to a particular type of school?

2. How do these factors affect your level of expenditure of education to your child?

    (a) Your Income

    (b) Gender of a child

    (c) Performance of a child in class

    (d) Number of dependants in your family

Appedix III

STATA OUPUT

1.0 Multiple Regression Analysis

1.1 Household head characteristics

Total per capita expenditure

```
. regress lnTSCHPER DSEX lnAGE DEDU2 DEDU3 DEDU4 DEDU5 DMARIT DSECTO, vce(robust)

Linear regression                               Number of obs =     105
                                                F(  8,    96) =   16.22
                                                Prob > F      =  0.0000
                                                R-squared     =  0.2708
                                                Root MSE      =  .91839
```

lnTSCHPER	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
DSEX	-.76426	.274098	-2.79	0.006	-1.30834	-.2201798
lnAGE	.6393535	.4528783	1.41	0.161	-.2596029	1.53831
DEDU2	.2921356	.2548847	1.15	0.255	-.2138065	.7980777
DEDU3	.9494714	.2719317	3.49	0.001	.4096912	1.489252
DEDU4	1.202558	.3107667	3.87	0.000	.5856905	1.819425
DEDU5	1.622777	.3167886	5.12	0.000	.9939569	2.251598
DMARIT	.9074682	.2208617	4.11	0.000	.4690613	1.345875
DSECTO	.1553326	.245802	0.63	0.529	-.3325805	.6432458
_cons	9.09046	1.779943	5.11	0.000	5.557302	12.62362

Non fee per capita expenditure

```
. regress lnNFSPER DSEX lnAGE DEDU2 DEDU3 DEDU4 DEDU5 DMARIT DSECTO, vce(robust)

Linear regression                               Number of obs =     105
                                                F(  8,    96) =    8.96
                                                Prob > F      =  0.0000
                                                R-squared     =  0.2119
                                                Root MSE      =  .62786
```

lnNFSPER	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
DSEX	-.4605832	.201773	-2.28	0.025	-.8610995	-.0600669
lnAGE	-.2152016	.3280425	-0.66	0.513	-.8663607	.4359576
DEDU2	.0174066	.2057335	0.08	0.933	-.3909713	.4257844
DEDU3	.4944507	.2057298	2.40	0.018	.0860804	.902821
DEDU4	.3972501	.1824826	2.18	0.032	.035025	.7594752
DEDU5	.5958928	.1927127	3.09	0.003	.2133611	.9784245
DMARIT	.7356862	.1714816	4.29	0.000	.3952979	1.076074
DSECTO	.2667594	.1415432	1.88	0.063	-.0142016	.5477203
_cons	12.34811	1.272858	9.70	0.000	9.821508	14.87471

1.2 Household Characteristics

Total per capita expenditure

```
. regress lnTSCHPER lnTNOP DHOUS ACRLAND lnINC, vce(robust)

Linear regression                               Number of obs =     105
                                                F(  4,   100) =   13.74
                                                Prob > F      =  0.0000
                                                R-squared     =  0.3089
                                                Root MSE      =  .87605

------------------------------------------------------------------------------
             |               Robust
    lnTSCHPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnTNOP |   .0606728   .2831772     0.21   0.831    -.5011426    .6224882
        DHOUS |   .2466453    .200777     1.23   0.222    -.1516906    .6449813
     ACRLAND |   .0163474   .0080528     2.03   0.045      .000371    .0323239
        lnINC |   .5543008   .0841989     6.58   0.000     .3872526    .7213491
        _cons |   4.976628   1.224525     4.06   0.000     2.547206     7.40605
------------------------------------------------------------------------------
```

Non fee per capita expenditure

```
. regress lnNFSPER lnTNOP DHOUS ACRLAND lnINC, vce(robust)

Linear regression                               Number of obs =     105
                                                F(  4,   100) =    5.18
                                                Prob > F      =  0.0008
                                                R-squared     =  0.1048
                                                Root MSE      =  .65565

------------------------------------------------------------------------------
             |               Robust
     lnNFSPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnTNOP |  -.2934315   .2314745    -1.27   0.208    -.7526703    .1658072
        DHOUS |   .1655865   .1579142     1.05   0.297    -.1477107    .4788837
     ACRLAND |    .007187   .0053296     1.35   0.181    -.0033867    .0177607
        lnINC |    .192593    .075936     2.54   0.013     .0419381     .343248
        _cons |   10.09096   1.140808     8.85   0.000     7.827634    12.35429
------------------------------------------------------------------------------
```

1.3 school characteristics

Total per capita expenditure

```
. regress lnTSCHPER DTYP1 DTYP2 DLOCD DLOCOR, vce(robust)

Linear regression                               Number of obs =     105
                                                F(  4,   100) =   75.41
                                                Prob > F      =  0.0000
                                                R-squared     =  0.6024
                                                Root MSE      =   .6645

------------------------------------------------------------------------------
             |               Robust
    lnTSCHPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       DTYP1 |  -.8503354   .1586208    -5.36   0.000    -1.165034   -.5356363
       DTYP2 |    .378868   .1644057     2.30   0.023     .0526917    .7050444
       DLOCD |  -.7980672   .2251033    -3.55   0.001    -1.244666   -.3514686
      DLOCOR |  -.0060994   .2089754    -0.03   0.977    -.4207006    .4085019
       _cons |   13.79341   .2054299    67.14   0.000     13.38585    14.20098
------------------------------------------------------------------------------
```

Non fee per capita expenditure

```
. regress lnNFSPER DTYP1 DTYP2 DLOCD DLOCOR, vce(robust)

Linear regression                               Number of obs =     105
                                                F(  4,   100) =    6.18
                                                Prob > F      =  0.0002
                                                R-squared     =  0.1669
                                                Root MSE      =   .6325

------------------------------------------------------------------------------
             |               Robust
     lnNFSPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       DTYP1 |   .2732304   .2198276     1.24   0.217    -.1629012     .709362
       DTYP2 |   .4544322   .2247835     2.02   0.046     .0084681    .9003962
       DLOCD |  -.3820928   .1729879    -2.21   0.029    -.7252959   -.0388898
      DLOCOR |   .2158697   .1964377     1.10   0.274    -.1738571    .6055966
       _cons |   12.28683   .2560008    48.00   0.000     11.77893    12.79473
------------------------------------------------------------------------------
```

1.2 Multicollinerity test and Ramsey RESET test

Household characteristics

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
       DHOUS |      1.17    0.854668
     lnTNOP |      1.14    0.878684
       lnINC |      1.10    0.912973
    ACRLAND |      1.09    0.916175
-------------+----------------------
    Mean VIF |      1.12

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnTSCHPER
       Ho:  model has no omitted variables
                  F(3, 97) =      0.56
                  Prob > F =      0.6434
```

Household head characteristics

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
        DSEX |      2.71    0.369404
      DMARIT |      2.58    0.388045
       DEDU2 |      1.45    0.689933
       DEDU3 |      1.29    0.772243
      DSECTO |      1.26    0.792108
       DEDU5 |      1.25    0.802987
       lnAGE |      1.08    0.924726
-------------+----------------------
    Mean VIF |      1.66

.
end of do-file

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnNFSPER
       Ho:  model has no omitted variables
                  F(3, 94) =      0.36
                  Prob > F =      0.7810
```

School characteristics

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
       DTYP1 |      6.24    0.160176
       DTYP2 |      5.63    0.177469
       DLOCD |      3.17    0.315944
      DLOCOR |      2.99    0.333935
-------------+----------------------
    Mean VIF |      4.51

. estsat ovtest
unrecognized command:  estsat
r(199);

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnNFSPER
       Ho:  model has no omitted variables
                  F(3, 97) =      0.11
                  Prob > F =      0.9550
```

Student characteristics

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
     PrGIRLS |      1.01    0.992377
      TNCHIL |      1.01    0.992377
-------------+----------------------
    Mean VIF |      1.01

. estat ovtest

Ramsey RESET test using powers of the fitted values of lnNFSPER
       Ho:  model has no omitted variables
                  F(3, 99) =      0.13
                  Prob > F =      0.9398
```

1.3 Heteroscedasticity Test Results

1.3.1 Student characteristics

(a) Total fee per capita expenditure

```
. estat imtest, white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(5)      =      4.37
         Prob > chi2  =    0.4970
```

(b) Non fee per capita expenditure

```
. estat imtest, white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(5)      =      5.90
         Prob > chi2  =    0.3159
```

1.3.2 Household characteristics

(a) Total fee per capita expenditure

```
. estat imtest, white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(13)     =     11.92
         Prob > chi2  =    0.5344
```

(b)Non fee per capita expenditure

```
. estat imtest, white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(13)     =     13.34
         Prob > chi2  =    0.4221
```

1.3.3 School characteristic

(a)Non fee per capita expenditure

```
. estat imtest , white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(7)      =      2.36
         Prob > chi2  =    0.9369
```

1.3.4 Household head characteristics

(a) Total per capita expenditure

```
. estat imtest , white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(25)     =     30.05
         Prob > chi2  =    0.2224
```

(a) Non fee per capita expenditure

```
. estat imtest , white

White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(25)     =     12.92
         Prob > chi2  =    0.9775
```

2.0 Tobit regression Analysis (Fee per capita education expenditure)

Household head characteristics

```
. tobit lnFTSHPER DSEX AGE AGESQ DEDU2 DEDU3 DEDU4 DEDU5 DMARIT DSECTO, ll vce(robust)

Tobit regression                                  Number of obs   =        105
                                                  F(   9,     96) =       4.60
                                                  Prob > F        =     0.0000
Log pseudolikelihood = -253.26004                 Pseudo R2       =     0.0469

------------------------------------------------------------------------------
             |               Robust
   lnFTSHPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        DSEX |  -12.71679    3.11194    -4.09   0.000    -18.89394   -6.539638
         AGE |   2.275757     .94875     2.40   0.018     .3925027    4.15901
       AGESQ |  -.0250483   .0102569    -2.44   0.016    -.0454081   -.0046886
       DEDU2 |  -8.508057   3.317065    -2.56   0.012    -15.09238   -1.923735
       DEDU3 |  -2.537205   3.090083    -0.82   0.414     -8.67097    3.596561
       DEDU4 |  -2.573745   2.700634    -0.95   0.343     -7.93446     2.78697
       DEDU5 |   2.333142   2.397706     0.97   0.333    -2.426267    7.092551
      DMARIT |   15.92497   3.494637     4.56   0.000     8.988171    22.86177
      DSECTO |   .0340828   2.127932     0.02   0.987     -4.18983    4.257995
       _cons |  -45.95465   21.67075    -2.12   0.037    -88.97076   -2.938541
-------------+----------------------------------------------------------------
       /sigma |   8.820605   .7958462                      7.240863    10.40035
------------------------------------------------------------------------------
  Obs. summary:         44  left-censored observations at lnFTSHPER<=0
                        61     uncensored observations
                         0 right-censored observations
```

Household characteristics

```
. tobit lnFTSHPER lnTNOP DHOUS ACRLAND lnINC, ll vce(robust)

Tobit regression                                  Number of obs   =        105
                                                  F(   4,    101) =      10.21
                                                  Prob > F        =     0.0000
Log pseudolikelihood = -251.39783                 Pseudo R2       =     0.0539

------------------------------------------------------------------------------
             |               Robust
   lnFTSHPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnTNOP |   1.795331    2.92036     0.61   0.540    -3.997877    7.588539
       DHOUS |   2.192583   2.374169     0.92   0.358    -2.517129    6.902295
     ACRLAND |   .1761077   .0919503     1.92   0.058    -.0062969    .3585124
       lnINC |   4.860182   .9788557     4.97   0.000     2.918396    6.801969
       _cons |  -66.12656   14.04231    -4.71   0.000    -93.98272    -38.2704
-------------+----------------------------------------------------------------
       /sigma |   8.571498   .7621167                      7.059663    10.08333
------------------------------------------------------------------------------
  Obs. summary:         44  left-censored observations at lnFTSHPER<=0
                        61     uncensored observations
                         0 right-censored observations
```

School characteristics

```
. tobit lnFTSHPER DTYP1 DTYP2 DLOCD DLOCOR, ll vce(robust)

Tobit regression                                Number of obs   =        105
                                                F(   4,    101) =      17.96
                                                Prob > F        =     0.0000
Log pseudolikelihood = -244.27172               Pseudo R2       =     0.0807

------------------------------------------------------------------------------
             |               Robust
   lnFTSHPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       DTYP1 |  -7.377635   2.017356    -3.66   0.000    -11.37953   -3.375743
       DTYP2 |  -.5415951    1.77176    -0.31   0.760     -4.05629      2.9731
       DLOCD |  -7.756939   1.756283    -4.42   0.000    -11.24093   -4.272946
      DLOCOR |  -.8117513   1.523567    -0.53   0.595    -3.834099    2.210596
       _cons |   15.50518   1.858558     8.34   0.000      11.8183    19.19206
-------------+----------------------------------------------------------------
      /sigma |   7.678842   .6872379                      6.315547    9.042138
------------------------------------------------------------------------------
  Obs. summary:         44  left-censored observations at lnFTSHPER<=0
                        61     uncensored observations
                         0 right-censored observations
```

Student characteristics

```
. tobit lnFTSHPER TNCHIL PrGIRLS, ll vce(robust)

Tobit regression                                Number of obs   =        105
                                                F(   2,    103) =       5.08
                                                Prob > F        =     0.0079
Log pseudolikelihood =  -262.3013               Pseudo R2       =     0.0129

------------------------------------------------------------------------------
             |               Robust
   lnFTSHPER |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      TNCHIL |   3.142373   1.094138     2.87   0.005     .9724095    5.312337
     PrGIRLS |  -3.104388   2.430819    -1.28   0.204    -7.925345    1.716569
       _cons |   1.351787   2.735711     0.49   0.622     -4.07385    6.777424
-------------+----------------------------------------------------------------
      /sigma |   9.740235   .8217575                      8.110472       11.37
------------------------------------------------------------------------------
  Obs. summary:         44  left-censored observations at lnFTSHPER<=0
                        61     uncensored observations
                         0 right-censored observations
```

2.1Specification test for tobit model

(a)Household head characteristics

```
. bctobit
Bootstrap replications (499)
----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
..................................................   50
..................................................   100
..................................................   150
..................................................   200
..................................................   250
..................................................   300
..................................................   350
..................................................   400
..................................................   450
.....................................................
LM test of Tobit specification
                    Bootstrap critical values
    lm        %10        %5        %1
  .917    3.10190   4.4121909  13.830833
```

(b) Child characteristics

```
. bctobit
Bootstrap replications (499)
----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
..................................................   50
..................................................   100
..................................................   150
..................................................   200
..................................................   250
..................................................   300
..................................................   350
..................................................   400
..................................................   450
.....................................................
LM test of Tobit specification
                    Bootstrap critical values
    lm        %10        %5        %1
  2.71    3.62596   5.0352979  10.211112
```

(c) Household characteristics

```
. bctobit
Bootstrap replications (499)
----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
..................................................   50
..................................................   100
..................................................   150
..................................................   200
..................................................   250
..................................................   300
..................................................   350
..................................................   400
..................................................   450
.....................................................
LM test of Tobit specification
                    Bootstrap critical values
    lm        %10        %5        %1
  .483    3.60342   6.4389815  19.226309
```

(d) School characteristics

```
. bctobit
Bootstrap replications (499)
----+--- 1 ---+--- 2 ---+--- 3 ---+--- 4 ---+--- 5
..................................................    50
..................................................   100
..................................................   150
..................................................   200
..................................................   250
..................................................   300
..................................................   350
..................................................   400
..................................................   450
.................................................
LM test of Tobit specification
                        Bootstrap critical values
      lm          %10          %5          %1
      1.764    3.65643   5.8996134  11.52318
```