

DETERMINANTS OF SCHOOL ENROLMENT IN SOMALIA: THE CASE OF PRIMARY EDUCATION

ABDULLAHI MOHAMOUD MOHAMED

X50/66603/2011

**Research Paper Submitted in Partial Fulfillment of the Requirements for the
Award of the Degree of Master of Arts in Economics of the University of
Nairobi**

2013

DECLARATION

This research project is my original work and has not been submitted for a degree in any other university.

Signature Date

Abdullahi Mohamoud Mohamed

X50/66603/2011

This research paper has been submitted for examination with our approval as University supervisors.

Signature Date

Dr. Anthony Wambugu

Signature Date

Dr. Patrick Machyo

DEDICATION

This research paper is dedicated to my loving wife, Fatuma Yusuf Ali and my two kids, Salma and Salman, who had to endure lonely days while I was in class. I was doing all this for you.

ACKNOWLEDGEMENT

All praise is due to Allah, to whom all knowledge, wisdom and power belong, for keeping me in good health, giving me a sound mind and strength to take me through the entire Masters program in Economics. Without His support and willingness this work would not have succeeded.

My supervisors, Dr. Anthony Wambugu and Dr. Patrick Machyo worked hand in hand with me to produce this research paper and their continued advice and support is highly appreciated. I however bear sole responsibility for any error and/or omissions in this paper.

Special thanks to Mogadishu University, particularly Prof. Ali Sheikh Ahmed, President of Mogadishu University for sponsoring my post graduate studies. Their support is highly appreciated without which this study would not have been completed.

I am greatly indebted to my dear parents and my siblings for their prayers. Last but not least, my word of thanks goes to my classmates for their fruitful comments and encouragement.

ABSTRACT

Universal primary education is one of the Millennium Development Goals (MDGs) to be reached by 2015. Somalia has one of the lowest primary school enrollment rates in Africa. The main objective of this paper was to investigate the determinants of primary school enrollment of boys and girls in Somalia. The study focused on primary school enrollment of children aged between 6 and 14 years using the Somalia 2006 Multiple Indicator Cluster Survey Data (MICS). Enrollment status was modeled using probit model. The explanatory variables are: child age, parental education, family size, wealth, regions, area of residence and time taken to fetch water.

The analysis separated boys and girls into sub-samples. The probit results show that the child's age, parent's education, wealth, regions and area of residence are important determinants of primary school enrollment for boys and girls in Somalia. The findings indicate that the chance for child to be enrolled increases with age at decreasing rate. Wealth has positive influence on the chance for child to be enrolled. The results further show that the wealth effect is larger for girls than boys. The results show that children whose father and mother have no education are less likely to be enrolled. But father's literacy was found to have greater effect on boy's enrollment than girl's enrollment. In contrast mother's literacy had larger effect for girls than boys. The probit results also found regional disparities in enrollment. Children from North West and North East had higher chance to be enrolled than children from South central.

Policy interventions focusing on increasing adult literacy and income of households in rural and urban areas of Somalia have potential to increase primary school enrollment. Targeting of educational resources allocation to the regions with low enrollments should be enhanced.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
ABSTRACT.....	v
LIST OF TABLES	viii
LIST OF ACRONYMS	ix
CHAPTER ONE: INTRODUCTION.....	1
1.0 Introduction	1
1.1 Background to the study.....	2
1.2 Overview of Education in Somalia	4
1.2.1 The Formal Education in Somalia	4
1.2.2 Expenditure on education in Somalia	5
1.2.3 School Enrollment Trends in Somalia	6
1.3 Statement of the Problem	7
1.4 Research Questions	7
1.5 Objectives of the Study	8
1.6 Justification of the Study.....	8
1.7 Scope of the study	9
1.8 Organization of the research paper.....	9
CHAPTER TWO: LITERATURE REVIEW.....	10
2.0 Introduction	10
2.1 Theoretical Literature.....	10
2.2 Empirical Literature	12
2.3 Conclusion of Literature Review	17
CHAPTER THREE: METHODS AND PROCEDURES.....	18
3.0 Introduction	18
3.1 Theoretical Model	18

3.2	Econometric Model Specification	19
3.3	Estimation Method	22
3.4	Variable Definition.....	24
3.5	Data Source	24
CHAPTER FOUR: EMPIRICAL RESULTS.....		26
4.0	Introduction	26
4.1	Descriptive statistics.....	26
4.2	Econometric Results.....	29
CHAPTER FIVE: SUMMARY, CONCLUSION AND POLICY		
IMPLICATION.....		35
5.1	Summary and Conclusion	35
5.2	Policy Implication	36
5.3	Areas of Further Research.....	37
References		38
APPENDIX		43

LIST OF TABLES

Table 1.1: Net Primary School enrollment rates (%) in Somalia, 2007	6
Table 3.1: Definition of variables used in the study	24
Table 4.1: Descriptive statistics of age 6-14, Somalia.....	27
Table 4. 2: Probit marginal effect of primary school enrollment in Somalia	30
Table 1: Probit estimates for primary school enrollment in Somalia with interaction terms	43
Table 2: Probit estimates for primary school enrollment in Somalia	45
Table 3: Primary School Gross Enrolment ratio in African Countries (% Gross), 2007-2010 ..	46

LIST OF ACRONYMS

EC	European Commission
GDP	Gross Domestic Product
LPM	Linear Probability Model
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MLE	Maximum Likelihood Estimator
MOE	Ministry of Education
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Low levels of education and training attainment are considered to be a major obstacle to economic growth and development (Glick & Sahn, 2000). The problem is a major concern in conflict and post conflict countries like Somalia aiming to revive their economies. This research paper focuses on primary education in Somalia.

Somalia gained independence in 1960 from British (the current Somaliland) and Italian (the current Puntland and Central South States) rule. The population of Somalia from its first census in 1975 was about 4.12 million (UNDP, 1997). Before the government was ousted in 1991, the population had grown to about 6.28 million in 1990 (UNDP, 1997). The World Bank (2012) estimated Somalia's population at 10.1 million out of which 37% lives in the urban area.

The major economic activity in Somalia is agriculture. Livestock farming contributes about 40% of the GDP and more than 50% of export earnings (World Bank, 2006). Other principal exports for Somalia include fish, charcoal, and bananas. During the civil war that began in 1991, the country maintained an informal economy based mainly on livestock and telecommunication. Due to the civil war it was difficult to get information. Still the World Bank estimated Somalia's GDP at US \$3.3 billion as of 1994, US \$4.1 billion as of 2001 and US\$5.731 in 2009 (World Bank,2012). The increase in GDP between 2001 and 2009 coincides with a sense of stability due to the interim government (Transitional National Government) formed in 2000 to guide the country into the third permanent government.

Somali households as indicated by a survey conducted by World Bank in 2002 generate income from multiple sources. These include self employment (50%), income from wage employment (14%), remittance (22.5%) and 13.5% from rent and aid (World Bank, 2006).

The state of education in Somalia currently is traced to the fragmentation of the country into three zones brought about by the civil war. The three zones are the Central South region, Somaliland in the northwest, and Puntland in the northeast. Puntland and Somaliland have functional democracies leading to gains in education access (UNESCO, 2011). This study will focus attention on primary education in Somalia.

1.1 Background to the study

The new growth theory views human capital as knowledge and ideas which are non-rival and partly excludable, and a source of endogenous growth (Romer, 1990). Endogenous growth theory holds that investment in human capital significantly contributes to long-run economic growth. Becker (1964) & Schultz (1961) argue that education is the major source of human capital.

Investing in education generates monetary and non monetary benefits to a country's economic development process. The monetary benefits include greater productivity, higher earnings to the educated and economic growth (Riddell, 2005). The non-monetary benefits on the other hand include improvements in health care, reduction in income inequality, poverty reduction as well as crime reduction (Glick & Sahn, 2000).

These potential benefits of education to national development motivate policy makers especially in developing countries to design policies aimed at increasing access to schooling (quantity and quality). Although the importance of primary education to the economy is widely recognized,

poor economic performance of the African countries makes it difficult to achieve universal primary enrolment (Glick & Sahn, 2005).

The 1990 World Conference on Education for All in Jomtien, Thailand set the goal that every child in every country should have the chance to complete at least a primary education by 2000 (UNESCO, 2005). This was however not achieved leading to an extension during the World Education Forum in Dakar in 2000. In the same year universal primary completion and gender equity in primary and secondary education were set as Millennium Development Goals, (UNESCO, 2005). UNESCO supports countries to build high quality primary education system that reach all children.

School enrollment is measured as gross enrollment ratio (GER) or net enrollment rate (NER). GER is defined as the number of children enrolled in a level (Primary or secondary), regardless of age divided by the population of the age group that officially corresponds to the same level. NER is defined as the number of child enrolled in primary school that belong to the age group that officially corresponds to primary schooling divide by the total population of the same age group. Primary education gross enrolment rose from 71% in 1999 to 89% in 2008 in developing countries. Over the same period gross enrolment increased by 18% in SSA, and by 8% and 11% in North Africa and Southern Asia respectively (UNESCO, 2011). This pace is however not sufficient to ensure that by 2015 all girls and boys of school age have completed primary school.

In Africa school enrolment has been low compared to other regions of the world such as OECD countries and South East Asia. For instance, United Kingdom, United Arab Emirate, Malaysia, Israel, Indonesia and China have primary school gross enrolment rate of 106, 105, 95, 111, 121 and 113 respectively. Table3 in the appendix shows the average gross enrolment in primary

schools in Africa in 2007- 2010. Gross enrolment rates in Africa range from 160 for Madagascar to 33 for Somalia. There is also dispersion in enrolments by gender. The highest enrollment rate for boys was in Madagascar (162) and the lowest was in Somalia with (42). Girls' enrolments rates were lower than boys' enrollment rates. The highest GER for girls was in Madagascar (158) and the lowest was in Somalia (23). The gap between boys' enrollments rate and girls' enrollment rate was largest in Chad (31) and lowest are in Ghana, Lesotho, Morocco, Uganda and Zambia (1). Some African countries have very low enrollment rates. These include Somalia at the bottom with GER of 33 followed by Eritrea at (48). Others are Djibouti (54), Niger (62), Cote d'Ivoire and Sudan & South Sudan both at (74) and Burkina Faso (78).

1.2 Overview of Education in Somalia

The Education in Somalia started during the colonial period. After independence in 1960, Somalia's education sector developed rapidly. Both the civilian and military governments that ruled Somalia before 1991 opened primary and secondary schools in every region of the country. Other efforts include training of teachers, adoption of the Latin script for the writing of the Somali language, and successful implementation of an intensive government-sponsored literacy campaign for youth and adults in both rural and urban areas. Due to these efforts and free and compulsory education for children 6 to 14 years, literacy levels increased from 5% in 1970 to 65% in 1990 (Abdi, 1998).

1.2.1 The Formal Education in Somalia

The Ministry of Education is officially responsible for education in Somalia. About 15% of the government's budget is allocated to scholastic instruction. The autonomous Puntland (North East) and Somaliland (North West) regions maintain their own Ministries of Education. Following the outbreak of the Somali Civil War in 1991, the task of running schools in Somalia

was initially taken up by community education committees established in 94% of the local schools (UNESCO, 2005).

After the government was overthrown in 1991, Somalia's state education system collapsed. By the time the Transitional Federal Government took leadership of the country in 2004, the literacy levels were reported to be 37% for the adult population aged over 15 years (MOE, 2011). The collapse of the state education system and the need for emergency education, led to establishment of privately owned educational institutions. Consequently, Somalia has two distinct systems of education: the 9-3-4 system which is mainly operated by private institutions and the 8-4-4 system currently practiced in public education (MOE, 2011).

1.2.2 Expenditure on education in Somalia

Expenditure on education is an indication of how a country prioritizes education in relation to its overall resource allocation. This includes spending on schools, universities and other public and private institutions involved in delivering or supporting education services (World Bank, 2004). In Somalia education sector received relatively lower in the 1970s and 1980s than other sectors of the economy. For instance, in 1980 about 10.5% of government expenditure went to social amenities which included education compared to 36% spent on defense and security in the same year (Samatar, 1988).

A substantial amount of education expenditure is from International donors. Since 2000, donor support for education has increased to reach US\$ 25 million per annum, with EC and EC member states as predominant donors in the sector (European Commission, 2009). It is estimated that there are 30-40 international NGOs working in the education sector in Somalia, mainly as

intermediaries for delivery of EC, UN and bilateral agency support in the sector (European Commission, 2009).

1.2.3 School Enrollment Trends in Somalia

Primary school enrolment rates in Somalia in the 1980s were relatively high with reported primary school gross enrolment rate of approximately 80% in 1986. This however, did not last for long following the collapse of the state government in 1991. As of 2000, the gross enrolment had declined to less than 30% (World Bank, 2008).

The collapse of the state in 1991 led to division of the country into three zones namely; Puntland (PL), Somaliland (SL) and South Central (SC) zone. Table 1.2 reports the net primary school enrolment in the three zones in 2007. The national net primary school enrolment was 32% in 2007.

Table 1.1: Net Primary School enrollment rates (%) in Somalia, 2007

Region /Zone	Primary Enrollment 2007 (% Net)		
	Female	Male	Total
South central	17.41	18.33	17.87
Somali Land	41.89	54.61	48.25
Puntland	29.82	31.56	30.69
Total	29.71	34.82	32.27

Source: European Commission, 2009

In Table 1.2 enrolment rates to seem correlate with zonal political stability. The NER are higher in Somaliland and Puntland than in South Central. Somaliland and Puntland are politically stable unlike South Central zone which was politically unstable for a longer duration of time.

1.3 Statement of the Problem

Human capital is considered as a means of increasing productivity and economic growth (Glick & Sahn, 2004). One source of human capital is education which generates monetary and non-monetary benefits (Schultz, 2004). The Millennium Development Goal number 2 is to achieve Universal Primary Education for all by 2015 (UNESCO, 2005).

Primary schooling enrolment rate is very low in Somalia compared to other African countries. Between 2007 and 2010 the average gross primary school enrollment was; 23% for girls and 42% for boys well below the average primary enrollment in the continent (World Bank, 2012). A variety of factors may explain this situation including poverty, gender, and opportunity cost of child's time.

However, few studies (e.g. Moyi, 2012a, 2012b) have investigated the determinants of primary school enrolment decision in Somalia and there are some gaps. They focus on conflict areas only (Moyi, 2012b) or the functional form estimated omit variables such as household size and time taken to fetch water that may determine school enrollments in Somalia. Also, they do not consider the nonlinear effect of a child's age on enrollment decisions, yet previous studies, (e.g. Glick & Sahn, 2000; Mariara & Mwabu, 2007; Al-Samarrai & Reilly, 2000), show that child's age can have important nonlinear effect related to late enrollment.

1.4 Research Questions

This study addresses the following questions: how do household variables and child specific variables influence primary school enrolment in Somalia? Are the factors influencing enrolment the same or different for boys and girls?

1.5 Objectives of the Study

The general objective of this study is to investigate the determinants of primary schooling enrollment of boys and girls in Somalia. The specific objectives include are

- a) Identify the factors influencing primary school enrollment in Somalia.
- b) Examine gender differences in the determinants of primary school enrollment in Somalia.
- c) Draw policy implications based on the findings of this study.

1.6 Justification of the Study

Investment in education is crucial for economic growth and reduction of poverty. Somalia is emerging from conflict and education is one of the priorities of the new government. Information on determinants of primary enrolment would help in the formulation of policy to develop primary education services towards attainment of the MDG of achieving universal primary education for all by 2015.

The Somali Federal Republic is campaigning to have 1 million children go back to school. Considering this, the policy recommendation of this paper will help the government in its effort of increasing the access for primary education for children in Somalia.

Unlike previous studies this study considers additional explanatory variables, Family size and time taken to fetch water which may be important for determining primary school enrollment. These two variables may be major barriers of sending a child to school in Somalia. Family size in Somalia tends to be large and relatively poor. So families may choose to send some children to school and not others, Water sources tend to be relatively far from the residence. A Family may allocate child time to fetch water instead of sending them to school.

1.7 Scope of the study

The study focus on human capital investment, specifically the determinants of primary school enrollment in Somalia for children aged 6-14 years. The study uses household survey data comprises of all the three Zones in Somalia (Puntland State, Somaliland, and South Central). There are disparities in terms of political stability and population density among the zones.

1.8 Organization of the research paper

The rest of the research paper is organized as follows. Chapter two reviews the relevant literature, both theoretical and empirical on determinants of primary school enrollment. The third chapter explains the methods and procedures used in the study to answer the research question. A theoretical framework is specified followed by an empirical framework. The data used in the study are described. The empirical results are presented in chapter four. Chapter five contains conclusion and policy implications.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviews relevant theoretical and empirical literature. The section on theoretical literature covers theoretical underpinnings of the determinants for school enrollments. The empirical literature review examines previous empirical studies on determinants for school enrollment. The chapter ends with an overview of the reviewed literature.

2.1 Theoretical Literature

Education is recognized as a key to development and an engine of growth (Almendarez, 2011). Economists regard education as a consumer as well as a capital good (Gertler & Glewwe, 1990). Education as a capital good is related to human capital concept. Goode (1959) defines human capital as skills, knowledge, aptitudes, attitudes and other acquired traits that contribute to production. Similarly, Blundell, Dearden, Meghir & Sianesi (1999) identify three major components of human capital; early ability (can either be innate or acquired); qualification and knowledge learnt through formal education; skills, competencies and proficiency that someone acquires through on the job training. Consequently, individuals invest in human capital to enhance their economic and social productivity (Almendarez, 2011).

Investing in human capital involves some initial costs in which the individual or a firm expects a return in the future, either through increased earnings or higher firm productivity (Blundell et al., 1999). Human capital is different from other assets since it receives returns equivalent to only the proportion of labour supplied by workers (Hall & Johnson, 1980). Ishikawa & Ryan (2002)

argue that it is the accumulation of human capital that primarily determines the returns of individuals.

Human capital theory in economics was first applied by Mincer & Becker both of Chicago school (Fleischhauer, 2007). Becker (1964) developed a model of individual investment in human capital. According to him, human capital was the same as a physical means of production. Earlier Becker (1962) defined human capital investment as all activities that were likely to influence an individual's real income in the future. Human capital investment is therefore expenditure on education, information, health, training and labour mobility (Weisbrod, 1966). The theory of human capital suggests that training or education will raise worker's productivity by passing on valuable knowledge and proficiency, hence raising workers' lifetime income (Becker, 1964).

Human capital theory assumes that individuals are utility maximizers. Lifetime perspective is taken whenever a choice is being made regarding education (Ehrenberg & Smith, 2006). The individual is assumed to compare near term investment cost with the present value of expected future benefit when making the decision on schooling. An individual will decide to enroll to schooling if the present value of future benefits exceeds costs.

The theory predicts that people who weigh future events with less importance, that is, those with high discount rate are less likely to enroll their children to school. The theory also predict that enrollment to school is mainly by the younger ones in the society. This is because they will have larger benefit in present value terms compared to older in the society. Another prediction of the theory is that education demand positively increases individual's lifetime earnings. The last prediction of the model concerns the cost borne to the investor. Investment in education will be

made if cost, that is direct cost (tuition, buying books and paying school fees) and the foregone earnings at present. For instance, if the tuition cost and foregone earnings fall, then enrollment is expected to increase (Ehrenberg & Smith, 2006).

2.2 Empirical Literature

A household decision to either enroll or not to enroll a child to formal schooling is usually a function of a number of factors. Factors identified by studies include; individual, household and community characteristics Glewwe & Jacoby (1994), Gertler & Glewwe, (1990).

Khandker, Lavy & Filmer (1994) classify factors determining child schooling as either demand side factors or supply side factors. Individual, household and community variables fall under the demand side factors, while access to school, and quality of schools fall under supply factors. Individual characteristics include age and gender of the child, and age rank among siblings. The household characteristics include household size, income of the household and other assets, education of the parents, gender of the household head and composition of the household while the community characteristics include schooling quality and location productive potential.

Individual characteristics

Age of a child is critical in primary school enrolment decision. Mariara & Mwabu (2007) found that a child's age is statically significant and positively linked to primary school enrollment. The probability of being enrolled increases at decreasing rate with child age. Similarly Al Samarrai & Peasgood (1998) found in Tanzania that the probability of enrollment in primary school to be significant and positively associated with age of a child, both girls and boys. This implies that younger children are less likely to be enrolled in primary school.

Ngware, Oketch & Ezeh (2008) also found a positive relation between the age of a child and primary school enrolment. Their study found that when a child's age increases by one year, then there was a 50% chance of that child being enrolled to primary school in Kenya.

Glick and Sahn (2000) on their part also found out that the probability of a child attending school in Guinea depends on his/her age. Handa, Simler & Harrower (2004) found that in Mozambique the age of a child is significant in determining enrolment in urban primary schools but not in rural areas. This is contrary to the results found Al- Samarrai & Reilly (2000) in Tanzania that the primary school enrollment rate in both rural and urban increases as the age of child increases.

Bedi, Kimalu, Manda & Nafula (2004) & Moyi (2012a & 2012b) similarly found age of a child to be positively linked to school enrolment in Kenya and Somalia respectively. However children may withdraw from school as they become older but the chance is higher for enrolling to school when the child is head of sibling in the household (Nielsen, 2001).

Gender of the child has also been found to be significant determinant of school enrolment. In Mozambique, Handa *et al.* (2004) found that in rural areas boys' enrolment probability was higher than that of girls. Similarly a study by Rahji (2005) found that boys were more likely than girls to attend school in rural South Western Nigeria. The study holds that traditional or cultural norms and beliefs may explain why boys' education is considered a better investment than girls' education. Moyi (2012a & 2012b) found that girls in Somalia were less likely than boys to be attended in Education however, not tested of gender differences in the determinants of enrollment was reported. Similarly, in Guinea parents mentioned that primary schooling was irrelevant to girls' future roles and so unlike boys, girls are not facilitated with schooling necessities (Glick & Sahn, 2000).

On the other hand, Glick & Sahn (2000) argue that parents attach greater preference to boy's education compared to girl's education because of low labor market returns to female education as a result of labour market discrimination against females. Another reason that makes gender an important determinant of child schooling is lower expected remittance from girls compared to boys. For example Boyle, Brock, Mace & Sibboas (2002) suggest that households tend to see boys' education bringing greater future economic rewards than girl's education.

Household Characteristics

Turning to household characteristics, Moyi (2012a & 2012b) found that the probability of children from wealthier households to be enrolled in school is high. Case & Deaton (1999) found that household income has significant positive effect in school enrolment of black children in South Africa. However, Case & Deaton (1999) further found that these household resources did not have significant effect on White children enrollment. Glick & Sahn (2000) also found that there is a positive relationship between household income and children schooling in Guinea. The main reasoning behind this is that households considered poor cannot afford to meet direct and indirect costs associated with schooling. Therefore, poor households are more likely to fail in sending their children to school and the effect is larger for girls than boys in Guinea because increase in household income lead to greater investments in girl's enrollment but has no significant impact on enrolling for boys. Similarly an empirical result found in Pakistan and Peru shows that low household income is major reason leading to withdrawal of many children from schools (Ray, 2000). Glick & Sahn (2000) also found that children from those households with easier access to credit were more likely to be enrolled and to stay in school longer.

The other significant determinant of school enrollment is parental education. Gertler & Glewwe (1990), Mariara & Mwabu, (2007) found similar results in rural Peru and Kenya respectively; that father's education is more important determinant of primary school enrollment than mother's education. However, at a given level of incomes and expenditures parental education effects may capture the positive attitude of educated parents in the accumulation of human capital instead of the availability of resources (Al-Samarrai & Reilly, 2000; Nielsen, 2001).

Gertler & Glewwe, (1990) further found that education of the parent was positively correlated to the school enrollment decision for children. On the other hand, Al Samarrai & Peasgood (1998) found that father's education had greater influence on primary schooling enrolment for boys while mother's education had greater influence on the girls' enrolment. Similarly, Glick & Sahn (2000) results found improvements in fathers' education to raise the schooling of both sons and daughters, but mothers' education had significant impact only on daughters' schooling in Guinea. Therefore if the household head is a male, then, boys and girls were likely to have similar patterns in school attendance whereas in those headed by females, girls are more likely to be enrolled in schools.

In Rwanda, Walque (2005) found that education of the educated female adult in the household has a positive and significant effect on primary schooling of adopted children, controlling for the schooling of biological parents and the child's relationship to the head of an adoptive household. Education of the most educated adult male in the adopting household had a smaller significant positive effect on adopted child's schooling than in a biological father-child relationship. According to Walque (2005), mother's education matters more for girls. Similarly, Rahji (2005) found in South west Nigeria that father's education significant for boys in primary school enrolment while that of the mother for girls' primary school enrolment.

Household size is also another significant determinant of school enrollment. Al-Samarrai & Reilly (2000) found in Tanzania positive and significant effect on primary school enrollment to the number of children in the household. This implies that the greater the number of child in household the less the time required per child for household production activity and thus the higher the likelihood of enrollment. This is in contrast for the result found both by Gertler & Glewwe (1990) in Peru, Al-Samarrai & Peasgood (1998) in Tanzania , Mariara & Mwabu (2007) in Kenya that the larger the numbers of both children and working age adults, the lower the probability of enrollment because of the competition for resources.

Community Characteristics

School enrolment is also influenced by community characteristics. Case & Deaton (1999), Case & Yogo (1999) found that school quality has large, positive and significant effects on years of completed education in South Africa. In Kenya, Bedi et al. (2004), Mariara & Mwabu (2007) found that quality of education measured by teacher pupil ratio did not significantly influence primary school enrolment in Kenya. Similarly, Glick & Sahn (2005) also found that teacher pupil ratio (schooling quality) did not have significant effect on primary school enrolment for rural households in Madagascar.

The availability or accessibility of school is another important community characteristic that determine schooling enrolment decision. Mariara & Mwabu (2007) found distance for primary school influencing negatively for primary school enrolment decisions in Kenya and also their result shows that distance of primary school significant for girls but not significant for boys. Similar findings were obtained by Bedi et al. (2004) in Kenya, and Glick & Sahn (2005), in Madagascar.

Filmer (2007) also found the distance to the nearest primary school statistical significant and negatively related to the primary school enrollment in 21 lower income countries. And in contrary to other studies, he found that the marginal effects of distance on enrollment to be very similar for boys and girls in western and central African countries. Distance of source of water to nearest primary school is also an important determinant of enrollment for both boys and girls. Mariara & Mwabu (2007) found in Kenya that the marginal effects of distance of source of water are more important for boys than for girls.

2.3 Conclusion of Literature Review

The literature review indicates that primary school enrolment is determined by individual, household and community factors. The individual characteristics include age and gender of the child. The household characteristic includes household income, education of the parents, household structure in terms of demographics and gender of the household head. The community characteristic includes the quality of schooling proxied by distance of the school, pupil teacher ratio and skills of the teacher. These studies used Household survey data, and employed binary choice econometric models since the enrollment rate is a discrete variable.

The current study will provide additional empirical evidence on the determinants of primary school enrolment in Somalia. Previous studies of school enrolment in Somalia, for example Moyi (2012b) focus on the conflict area of south central in Somalia, and estimate schooling equations that omit important variables. This study will differ with that of Moyi (2012a & 2012b) by focusing on only the Primary school enrollment for Boys and Girls aged 6 to 14 years. This study will also differ with that of Moyi (2012a & 2012b) by employing additional explanatory variables which might be determine in primary school enrollment in Somalia.

CHAPTER THREE: METHODS AND PROCEDURES

3.0 Introduction

This chapter discusses methodology employed in the study. The methods and the procedures discussed have been motivated by the reviewed literature both theoretical and empirical in the previous chapter and the type of data available.

3.1 Theoretical Model

Following Gertler and Glewwe (1990), for a household that decides to enroll a child to school, the utility expectation can be denoted as follows;

$$U_1 = U(Z_1, Y_1) + \varepsilon_1 \dots\dots\dots 1$$

Where Z_1 is the increase in human capital of the child from an extra year of schooling while Y_1 is the expenditure possible after spending both indirect and direct costs of enrolling a child to school. ε_1 is a random error term. On the other hand, if a household decides to keep their children at home and fail to enroll them to school, the utility will be denoted as;

$$U_0 = U(Y_0) + \varepsilon_0 = U(0, Y_0) + \varepsilon_0 \dots\dots\dots 2$$

The household faces a budget constraint of the form denoted below;

$$Y_1 + TC_1 = Y_0 = Y^d \dots\dots\dots 3$$

Where TC_1 is the total cost of enrolling a child to school which includes both the indirect and direct costs while Y^d is disposable income of the household.

The absolute utility maximization problem is obtained by combining equation (1) and (2) while considering the budget constraints defined in equation (3), denoted as;

$$U^* = \text{Max} (U_0, U_1) \dots\dots\dots 4$$

Where U^* the maximum utility, while U_0 and U_1 are the constrained utility functions illustrated in equations (1) and (2) respectively.

3.2 Econometric Model Specification

The utility maximization problem in equation (4) once solved, would give the probability of choosing each alternative. Since discrete choice model entails a decision maker choosing among a set of alternatives, the probability that one alternative is chosen over another can be interpreted as a school enrollment function, which is derived from the problem of utility maximization. The probability of choosing one alternative equals the probability that the alternative chosen yields the maximum possible utility amongst the alternatives.

According to Gertler and Glewwe (1990), the probability that a household enrolls their children to school can be derived by stating the restricted utility function as;

$$U_1 = \beta_1 Z_1 + \beta_2 Y_1 + \varepsilon_1 \dots\dots\dots 5$$

Where β_1 and β_2 are the parameters to be estimated in the model while ε_1 is the error term which has a mean of zero, finite variance and is uncorrelated among individuals.

From equation (3) we can obtain

$$Y_1 = Y^d - TC_1 \dots\dots\dots 6$$

Substituting equation (6) in equation (5) we get;

$$U_1 = \beta_1 Z_1 + \beta_2 (Y^d - TC_1) + \varepsilon_1 \dots \dots \dots 7$$

Equation (7) represents the utility derived from enrolling a child to school. The utility of failing to enroll a child to school can be expressed as follows;

$$U_0 = \beta_2 (Y^d) + \varepsilon_0 \dots \dots \dots 8$$

Households enroll their children in primary school if $U_1 > U_0$ if $U_1 \geq U_0$ the child is not enrolled.

Let $S^* = U_1 - U_0$ where S^* is net gain of enrolling child in school. S^* is a function of individual, household and community characteristics (X_i) that effect Z_1 and TC_1 .

$$S_i^* = \gamma X_i + \varepsilon_i \dots \dots \dots 9$$

Where γ is vector of parameters and ε_i an error term S^* is not observed. Instead define an observable indicator S

$$S_i = 1 \text{ if } S^* > 0$$

$$S_i = 0 \text{ if } S^* \leq 0$$

The probability of a child enrolling in school is therefore given as;

$$\begin{aligned} \text{Prob}[S_i = 1] &= \text{Prob}[\gamma X_i + \varepsilon_i > 0] \\ &= \text{Prob}(\varepsilon_i' > -\gamma X_i) \\ &= 1 - \Phi(-\gamma X_i) \\ &= \Phi(\gamma X_i) \dots \dots \dots 10 \end{aligned}$$

Where $\Phi(\cdot)$ is the standard normal cumulative distribution function.

The dependent variable of the model is the probability of a child from household i being enrolled in primary school. It will take two values; 1 if the child is enrolled and 0 otherwise. The independent variables in vector X include individual, household and community characteristics.

Individual child characteristics: (age of child and gender of child). This study will take the school age children to be between the ages of 6 and 14. The study expects that the younger age the child, the higher the probability that the child is enrolled in primary school because the older the child the higher probability of assisting family. The study, however, expects female children enrollment to be less likely to enroll compared to boys due to cultural background of the community. These expectations are in line with findings in previous studies (Bedi, *et al.*, 2004), & (Handa *et al.*, 2004).

Household characteristics: household size, household wealth (asset ownership) and parent's education. This study expects both education of the parents and wealth of the household to positively influence probability of primary school enrolment. This implies that households with educated parents are more likely to enroll their children in primary school as well as those households with higher wealth index, because of positive relationship of household wealth and schooling. The size of the household is expected to affect enrolment either positively or negatively, the expectations are supported by findings of other studies like Case & Deaton, (1999), Glick & Sahn, (2000).

Community characteristics: distance of the source of water, and the type of residence. The study expects those households whose source of water is distant from the home to have low enrolment since children will be spending time to collect water. Households located in rural areas are

expected to have low enrolment rates compared to their counterparts in the urban areas, because in rural areas school services are limited. The expectations are supported in previous studies such as Mariara & Mwabu, (2007), Al-Samarrai & Reilly, (2000), Rahji, (2005)

3.3 Estimation Method

The specified model is a binary choice model since enrollment rate is a discrete variable. Thus the dependent variable can take two values; 1 if the child is enrolled to school and 0 if the child is not enrolled to school. In such a case the objective is to estimate the relationship between the probability of a child’s enrolment status and individual, household and community characteristics. Estimation of models with binary dependent variables can employ three approaches; the linear probability model (LPM), the logit model or the probit model (Gujarati 2007).

The LPM is the simplest to use of the three models though it has serious limitations (normality assumption violation, heteroscedasticity, and estimated probability lying outside 0-1 bounds). What is generally needed is a probability model which has an S-shaped feature of the cumulative distribution function. In practice logistic and the normal cumulative distribution function are chosen (i.e. logit and probit models respectively). This is because they correct the problem of non-normality and the possibility of the dependent variable lying outside the 0-1 range (Gujarati, 2007). The parameters of the model will be estimated using a MLE technique. The log-likelihood function for the model is specified as follows;

$$\log L (\gamma; s, x) = \sum_{i=1}^n (s_i \log \Phi(x_i' \gamma) + (1 - s_i) \log \{1 - \Phi(x_i' \gamma)\}) \dots \dots \dots 13$$

Maximum likelihood estimate $\hat{\gamma}$ solves the first order condition for maximization. The MLE has the desirable statistical properties of normality, efficiency and consistency asymptotically (Long, 1997). This implies that the said properties hold as the study sample size increases.

We can only interpret the sign and significance of the coefficients when we use the probit model. However, from equation (10) we can derive the marginal effects for probit model for continuous variables. Differentiating equation (10) with respect to the independent variables yields the probability density function given below;

$$\partial Pr(s = 1|x) / \partial x_i = \Phi(\cdot) \dots\dots\dots 14$$

Whereas the marginal effects for dummy variables are computed using formulas;

$$Pr(s = 1|x_i = 1) - Pr(s = 1|x_i = 0) \dots\dots\dots 15$$

3.4 Variable Definition

Table 3.1 presents definitions of both dependent and independent variables of the study.

Table 3.1: Definition of variables used in the study

Dependent Variable	Definitions
Primary school enrolment	Equals 1 if child enrolled in primary school , 0 other wise
Explanatory variables	
Individual /Child Characteristics	
Age	Age of child in year (6-14 years)
Male	Male = 1 if a child is a boy , 0 otherwise
Household Characteristics	
Household Size	Refers to the number of regular household members
Education level of the father and mother	None =1 if No education, 0 otherwise Non curriculum =1 if Non curriculum,0 otherwise Primary =1 if Primary, 0 otherwise Secondary = 1 if Secondary,0 otherwise Tertiary = 1 if Tertiary,0 otherwise
Wealth Index	Refers to household's ownership asset such , Number of rooms in house , Land owned by household ,and it measures household's cumulative living standard
Community Characteristics	
Rural	Rural= 1 if Household reside in rural, 0 otherwise
time taken to fetch water	It is a measure of time (minutes) spend child to fetch water from source go and back
North east regions	North east = 1 if Household reside in North east regions (Puntland) , 0 otherwise
South central regions	South central = 1 if Household reside in south central regions, 0 otherwise

3.5 Data Source

To determine the school enrollment for primary education in Somalia, this study will use the Somali 2006 Multiple Indicator Cluster Survey (MICS). The Somali 2006 MICS was implemented by UNICEF Somalia in collaboration with the Pan-Arab Project for Family Health

(PAPFAM) project of the League of Arab States. This is the third MICS survey. The first MICS was conducted in 1995 and it covered only Somaliland. The second MICS was conducted in 1999. The surveys aim to assess the Health and Education situation of children and women in Somalia. Details about the survey 2006 can be found in UNECEf Somali (UNECEf, 2007).

The Somali 2006 MICS was a nationally representative sample survey that covered 5,969 households. The sample was selected in four stages. First, a predetermined number of clusters were selected in each zone- Somaliland (60 clusters), Puntland (60 clusters), and Central South Somalia (130 clusters). Second, districts were selected in each zone using proportional probability to size; within the districts, permanent and temporary settlements were selected. The temporary settlements were included to ensure they included nomads. Third, clusters were selected within settlements. Finally, households were randomly selected.

The questionnaires collected information on the household, the parent or guardian, and the eligible children (6–18 years). The questionnaires were used to provide information on education among school-age children, with a focus on factors influencing household decisions about schooling. This study takes sample of child for primary school age 6-14 years.

CHAPTER FOUR: EMPIRICAL RESULTS

4.0 Introduction

This chapter presents the results of the study. The first section presents descriptive statistics of the variables included in the study. The second section presents the probit regression results, and the discussion of results.

4.1 Descriptive statistics

In this section the characteristics of the sample used in the study are presented. This study has focused on the effects of individual, household and community characteristic on schooling. The unit of analysis is boys and girls of school age (6-14years). Table 4.1 presents the means and standard deviations of the explanatory variables used in the study.

Table 4.1: Descriptive statistics of age 6-14, Somalia

Variable	Boys		Girls		Full sample	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Child characteristics						
Child enrolled in school	0.673	0.469	0.515	0.499	0.597	0.490
Child age(6-7)	0.153	0.360	0.159	0.366	0.156	0.363
Child age(8-9)	0.279	0.448	0.282	0.450	0.280	0.449
Child age(10-11)	0.236	0.424	0.217	0.412	0.227	0.419
Child age(12-13)	0.177	0.382	0.180	0.384	0.179	0.383
Child age (14)	0.152	0.359	0.159	0.366	0.155	0.362
Child is male					0.516	0.499
Household characteristics						
Household size	7.897	2.368	7.853	2.329	7.876	2.349
Father's Education level						
None	0.336	0.472	0.340	0.473	0.338	0.473
Primary	0.326	0.468	0.312	0.463	0.319	0.466
Secondary	0.152	0.359	0.160	0.366	0.156	0.363
Tertiary	0.157	0.364	0.159	0.366	0.158	0.365
Non curriculum	0.025	0.158	0.027	0.162	0.026	0.160
Mother's Education level						
None	0.625	0.484	0.647	0.477	0.636	0.481
Primary	0.168	0.374	0.162	0.369	0.165	0.371
Secondary	0.139	0.346	0.125	0.331	0.133	0.339
Tertiary	0.044	0.207	0.0415	0.199	0.043	0.203
Non curriculum	0.215	0.145	0.022	0.149	0.022	0.147
Wealth index	0.0042	1.064	-0.031	1.042	-0.012	1.054
Community characteristics						
North west region	0.241	0.428	0.262	0.440	0.251	0.434
North East region	0.199	0.399	0.196	0.397	0.197	0.398
Central and south regions	0.559	0.496	0.541	0.498	0.550	0.497
Urban residence	0.367	0.482	0.350	0.477	0.359	0.479
Rural residence	0.632	0.482	0.649	0.477	0.640	0.479
Time taken to fetch water	122.2	218.6	112.01	202.7	117.2	211.15
Number of observations	3245		3033		6278	

Source: Computed from the 2006 MICS Data in Somalia

Table 4.1 shows that out of the 6278 observations, 59% of the school aged children were enrolled to primary school. The percentage of boys enrolled stood at 67% while that of girls was 51%. About 52% of the sample is male children.

About 15% of 16% of boys and girls respectively, are 6-7 years old. Similar proportions of the boys and girls were 14 years old. Most children in the sample were 8-9 years old.

One third (33%) of father's in the sample had no education, 31% had primary education, 15% had secondary education, and 16% had tertiary education, and also 3% had non curriculum education (non formal education). A different pattern is observed among mothers. Majority of the mother (63%) had no education, 16% had primary education, 13% had secondary education, and only 4% had tertiary education, while 2% had non curriculum education. This shows that Education attainment is very low among mothers compared to fathers.

The largest household size is 16 members and the smallest is 2 for boy's households and 3 for girl's households. The average household size is almost 8 members in girls' and boys' households.

There is great disparity in household wealth (proxied by wealth index) with the wealthiest household having a wealth index of 3.99 while the poorest household wealth score is -1.05. The average wealth index is -0.012. In terms of wealth difference girls seem to live in poorer households than boys. The mean wealth index in girl's households was -0.0311 while in boy's household it was 0.00424.

The majority (55%) of children in the sample used for the study was from South Central regions, 25% were from North West regions (Somaliland), and 19% were from North east regions (Puntland).

Further majority (64%) of the children were from rural areas compared to 36% who were from the urban areas.

The time taken to reach the nearest water source was used as proxy for the time that children might spend outside school fetching water. This time would otherwise be spent either in school or doing school work. The average time is 122.2 minutes for boys and 112minutes for girls.

4.2 Econometric Results

Previous studies on determinants of schooling enrollment have demonstrated that girls and boys differ in their schooling enrollment functions (e.g. see Glick & Sahn, 2000; Mariara & Mwabu, 2007). Therefore this study first estimated a school enrollment function containing the male dummy; all explanatory variables and their interactions with the male dummy (see Table1 in Appendix).

The study tested whether the coefficient on the male dummy and on the interaction terms were jointly equal to zero. The null hypothesis is that there is no difference in primary school enrollment function of boys and girls aged between 6-14 years in Somalia. The chi-square test statistic computed is 235.46. The p-value (0.0000) is less than the conventional levels of significance (1%, 5%, and 10%). Therefore the null hypothesis is rejected. This implies that girls and boys in Somalia have different primary school enrollment functions. Hence separate models of boys and girls are estimated.

Table 2 in the Appendix presents the probit estimate for the determinants of Primary school enrollment in Somalia. The dependent variable is coded 1 if a child is enrolled in primary school and zero otherwise. The coefficients of the probit model relate to the underlying linear index. These are therefore normally interpreted in terms of the latent variable y^* which is inherently

unobservable and is not measured in any kind of natural units unlike the probability of being enrolled. In themselves therefore the coefficients can only be interpreted as changes in probit index (Long, 1997). In order to interpret the quantitative implications of the results we have to compute the marginal effects for continuous variables and differences in probability of being enrolled for the dummy variables.

Table 4.2 presents estimated marginal effects of the probit regressions of primary school enrolment for girls and boys in Somalia.

Table 4. 2: Probit marginal effect of primary school enrollment in Somalia

Variables	BOYS			GIRLS		
	Marginal effect	Z	P-value	Marginal effect	Z	P- value
Child Age*						
Child age (6-7)	- 0.462	-13.15	0.000	-0.312	-8.78	0.000
Child age (8-9)	-0.245	-8.14	0.000	-0.160	-5.05	0.000
Child age (10-11)	-0.128	-4.17	0.000	-0.037	-1.12	0.265
Child age (12-13)	-0.063	-1.96	0.050	-0.046	-1.33	0.182
Household characteristics						
Father's Education level**						
None	-0.158	-2.71	0.007	-0.127	-1.91	0.056
Primary	0.022	0.40	0.688	-0.012	-0.19	0.850
Secondary	0.033	0.58	0.560	-0.047	-0.69	0.492
Tertiary	0.042	0.70	0.486	0.008	0.12	0.908
Mother's Education level**						
None	-0.100	-1.61	0.108	-0.217	-3.02	0.003
Primary	-0.012	-0.19	0.853	-0.026	-0.35	0.727
Secondary	-0.011	-0.16	0.869	-0.047	-0.60	0.550
Tertiary	-0.064	-0.73	0.468	-0.151	-1.55	0.121
Household size	0.003	0.79	0.428	0.002	0.62	0.535
Wealth index	0.133	8.00	0.000	0.224	12.15	0.000
Community characteristics						
North east***	0.101	4.05	0.000	0.117	3.83	0.000
South central	0.077	3.38	0.001	-0.011	-0.42	0.675
Rural residence****	-0.127	-4.76	0.000	-0.087	-2.87	0.004
Time taken to fetch water	-0.214	-0.55	0.586	-0.334	-0.67	0.505

*Reference group of age is age 14 years

**Reference group of father's/mother's edu level is non curriculum(literacy education)

***Reference group of dummy region is North west

****Reference group for residence is urban residence

Note: df/dx is marginal effect. df/dx is for discrete changes of dummy variable from 0 to 1

The results show the probability of a boy or girl reporting as being enrolled in primary school as function of a set of explanatory variables. The marginal effect on dummy variable for age of boys and girls aged 6-7 years are -0.462918 and -0.312 respectively and statistically significant at 1% level. This implies that the probability of being enrolled for boys and girls aged 6-7 years is lower than for boys and girls aged 14 years by 46.2 percentage points and 31.2 percentage points respectively. The marginal effect on the dummy variable for 8-9 years age bracket for boys and girls are -0.2454 and -0.1605 and statistically significant at the 1% level respectively. Therefore boys and girls aged 8-9 years are 24.5 percentage points and 16.05 percentage points respectively less likely to be enrolled than those aged 14 years.

The marginal effect on the dummy variables for 10-11 years age bracket for boys is -0.128 and statistically significant at 1% level. Therefore boys aged 10-11 years are 12.8 percentage points less likely to be enrolled than those aged 14 years. The marginal effect on dummy variable for 10-11 years age bracket for girls is -0.037 and statistically insignificant at conventional levels (1%, 5% and 10%). The marginal effect on the dummy variables for 12-13 years age bracket for boys is -0.063 and statistically significant at 5% level. This implies that boys aged 12-13 years are 6.3 percentage points less likely than those aged 14 years to be enrolled. However, the marginal effects on the dummy variables for girls aged 12-13 years is -0.046 and statistically insignificant at conventional levels (1%, 5% and 10%). These results are similar to those by Mwabu & Mariara (2007) who found enrolment increasing at a decreasing rate with age.

Household size is positively related to child enrollment in primary school. However, the effect is statistically insignificant. Moreover, its effect on both boys and girls enrollment chances was very low. Time taken to fetch water has a negative effect on boys and girls enrollment chances.

Though, the effect is statistically insignificant. The marginal effects of time taken to fetch water are also very small.

Parental education is another explanatory variable that was considered to determine enrollment decision of primary school. The marginal effect of Father's education level with none for boys and girls aged 6-14 years is -0.158 and -0.127 and statistically significant at 1% and 5% respectively. This implies that boys and girls aged 6-14 whose father has no education are 15.8 percentage points and 12.7 percentage points less likely to be enrolled than boys and girls aged 6-14 whose father has non curriculum education respectively. Boys whose fathers have primary and secondary education are more likely to be enrolled in primary school. On the other hand, girls whose fathers had primary and secondary education are less likely to be enrolled in primary school. However, the effect of father's primary and secondary education for both boys and girls are statistically insignificant at conventional levels (1%, 5% and 10%). Father's tertiary education is positively related to the chance of child being enrolled to primary school. However, the effect is statistically insignificant at conventional level (1%, 5%, and 10%).

The marginal effect of mother's education level with none for boys and girls aged 6-14 years is -0.100 and -0.217 and statistically significant at 10% and 1% level respectively. However, boys and girls whose mother has no education are 10 percentage points and 21.7 percentage points less likely to be enrolled than boys and girls whose mother has non curriculum education. Boys and girls whose mothers have primary, secondary and tertiary education are less likely to be enrolled in primary school. However, the effect of mother's primary, secondary and tertiary for boys and girls are statistically insignificant at conventional levels (1%, 5% and 10%). These results are similar to other studies such as Mariara & Mwabu (2007), Gertler & Glewe (1990) who found parents education increasing the probability of enrolling a child to primary school.

The economic situation of a household was found to determine children primary school enrollment. The indicator of economic situation (wealth index) was found to exert a positive and statistically significant at 1% level effect for both boys and girls. The marginal effect for wealth index is 0.133 for boys and 0.224 for girls. This implies that households that are wealthy have higher chance of enrolling their children to school. However, the wealth effect is larger for girls than boys. The study results show that girls from wealthy households have 22.46 percentage points higher probability of being enrolled compared to 13.32 percentage points for boys. These results are in line with other studies that posit a positive relationship between enrollment to school and household income (Glick & Sahn, 2000 & Ray, 2000). However the difference in wealthier family for preference to girls can be explained in two ways when it comes to Somali community prospective first the wealthier family's boys may prefer to help family in their business instead of sending them to school or they drop the school because of seeing the education less opportunity to their future while they were offered everything from their parents.

Second, the wealthier family can hire house help which gives chance their daughters to send to school instead of helping house work; the other side girls get chance from school for meeting friends more interaction to society and entertainments.

The area of residence has negative and statistically significant (1%, 5%, 10%) effect on probability of primary school enrolment for both boys and girls. The estimated marginal effects are -0.1276 for boys and- 0.0878 for girls. This implies that boys in rural areas are 12.76 percentage points less likely than urban boys (6-14) to be enrolled. On the other hand girls in rural areas are 8.78 percentage points less likely than urban girls to be enrolled in primary school.

This study also sought to know whether children from a particular region in Somalia had higher probability of enrollment than the other regions. The study found that region is key determinant of the probability of a child being enrolled in primary school in Somalia. The marginal effect for boys from North East region is 0.1017 while that of girls is 0.1171. This implies that boys and girls from North East region are 10.17 and 11.71 percentage points more likely than boys and girls in North West region to be enrolled to primary school. The marginal effect for boys from South Central region is 0.0771 while that of girls is -0.01107. This implies that boys from South central are 7.71 percentage points more likely than boys from North West to North East. However girls from south central region are -1.107 percentage points less likely than girls from North West to North East.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATION

5.1 Summary and Conclusion

Low primary school enrolment in Somalia coupled with gender gaps have remained for decades a very serious issue of policy concern. The main objective of this study was to investigate the factors that determine primary school enrollment of boys and girls in Somalia. The study used the 2006 MICS data collected by UNICEF and PAPFAM. The sample of the study was restricted to children aged between 6 and 14 years.

Probit equations of school enrollment were estimated using Maximum Likelihood method. Tests for pooling indicate that girls and boys in Somalia have different school enrollment functions. Therefore, the analysis separated boys and girls in to sub-samples.

The results of the probit model of probability of a child being enrolled to school show that child's age, parent's education, wealth, regions, and area of residence are some of factors that influence the chance of primary school enrollment for girls and boys. The probability of being enrolled increases with child's age at decreasing rate. In terms of gender boys are more likely than girls to be enrolled.

Children from wealthier households have higher probability of being enrolled to school than the children from poorer households. The result shows that the wealth effect is large for girls than boys.

Education of the parents was also found to exert effect on enrolment status of children. The results show that boys and girls whose parents had no education were less likely to be enrolled

relative to boys and girls whose parents had at least some non curriculum. This indicates that in Somalia the literacy of mother and father increases the chance of enrolling child to primary school. Father's literacy had greater effect on boy's enrollment than girl's enrollment. Mother's literacy had the greater effect on girl's than boy's enrollment.

Children in rural areas were less likely than urban children to be enrolled to primary school. The effect was larger for boys than girls. Children in regions which were fairly stable such as North West (Somaliland) and North East (Puntland) had higher chances of being enrolled to primary school. In contrast, children in Central South region which has been politically unstable for some time were less likely to be enrolled.

In north east girls have greater chance to be enrolled in primary school compared to girls from North West regions. Girls from central south are less likely compared to girls from North West regions to be enrolled. On the other hand boys from south central are more likely than boys from the North West regions to be enrolled.

5.2 Policy Implication

Primary school enrollment is higher among children whose parents are literate. Policies to raise literacy levels should be pursued. This could be done by strengthening adult literacy programs in rural and urban areas of Somalia.

Children (6-14) from poorer households are less likely to be enrolled their children in to primary school. Therefore, policies that improve the living conditions of households in Somalia would increase primary school enrolment for both boys and girls.

Boys (6-14 years) have higher probability of being enrolled than girls. Education policies which target specifically girls have potential positive impact on enrollment of girls thereby decreasing the gender primary schooling gap.

Observed regional disparities in primary school enrollment probabilities suggest targeting of education resources to regions with low enrollments. Targeting should also take in to account gender of child, given gender differences in enrollments with in regions.

5.3 Areas of Further Research

A number of areas require research at the national as household levels to provide the necessary information to determine the factors influencing primary school enrolment decision for boys and girls in Somalia. In particular the other outcomes that could be analyzed are; dropout, grade repetition and examination performance which may also determine the school enrollment in Somalia yet very little is known about this. Future researcher could also consider national primary data which could be up to date.

References

- Abdi, A. A. (1998). Education in Somalia: History, destruction, and calls for reconstruction, *Comparative Education*, 34, 314-327.
- African Development Bank. (2010). Somali Country Brief, Regional Department, Nairobi Kenya.
- Aliu, S. (2001). The Competitive Drive, New Technologies and Employment, The Human Capital Link, A Paper presented at the Second Tripartite Conference of Manpower Planners. Chelsea Hotel, Abuja December,11,2001.
- Almendarez, L. (2011). Human Capital Theory; Implications for Educational Development. Conference Paper, Presented at the Belize country second conference 12 October, 2010.
- Al-Samarrai, S. & Reilly, R. (2000). Urban and Rural Differences in Primary School Attendance: An Empirical Study for Tanzania, *Journal of African Economies*, 9, 430-474.
- Al-Samarrai, S. & Peasgood, T. (1998). Educational Attainments and Household characteristics in Tanzania. IDS Working Paper 49, University of Sussex, Institute of Development Studies.
- Becker, G. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy*, 7. 9-49.
- Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, Columbia University Press, New York.
- Bedi, S. A., Kimalu, P. K., Manda, D. K. & Nafula, N. (2004). The Decline in Primary School Enrollment in Kenya, *Journal of African Economies*, 13, 1-43
- Behrman, J. R. & Knowles, J. C. (1999). Household Income and Child Schooling in Vietnam, *World Bank Economic Review*, 13, 211-56

- Blundell, R., Dearden, L., Meghir, C. & Sianesi, B. (1999). Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy, *Fiscal Studies*, 20, 1-23.
- Boyle, S. Brock, A., Mace, J. & Sibboas, M. (2002). *Reaching the Poor, the Cost of Sending Children to School, a Six Country Comparative Study* a Synthesis Report, Department for International Development, Educational papers, UK.
- Case, A. & Deaton, A. (1999). School inputs and Educational outcomes in South Africa. *Quarterly Journal of Economics*, 114, 1047-1084.
- Case, A. & Yogo, M. (1999). Does School Quality Matter? Returns to Education and the Characteristics of Schools in South Africa, Mimeo Princeton University.
- Deon, F. (2007). If you build it, will they come? School availability and school enrollment in 21 countries, *The Journal of Development Studies*, 43,901-928.
- Ehrenberg, G. R. & Smith, R.S. (2006). *Modern Labor Economics: Theory and Public Policy*, Pearson Education, Inc USA – New York.
- European Commission, (2009). Study on Governance challenges for Education in Fragile Situation: Somalia Country Report, Brussels
- Fleischhauer, K. (2007). A Review of Human Capital Theory; Microeconomics, *Discussion Paper*, Iniversita St. Gallen, Switzerland.
- Gertler, P. & Glewwe, P. (1990). The Willingness to Pay for Education in Developing Countries, *Journal of public Economics*, 42, 251-275
- Glewwe, P. & Jacoby, H. (1994). Student Achievement and Schooling in low income countries: Evidence from Ghana, *Journal of Human Resources*. 29, 843-864
- Glick, P. & Sahn, D. E. (2000). Schooling of Girls and Boys in a West African Country; The Effects of Parental Education, Income, and Household Structure, *Economics of Education Review*. 19, 63-87.

- Glick, P. & Sahn, D. E. (2005). The Demand for Primary Schooling in Rural Madagascar: Price, Quality and the Choice between Public and Private Providers, *CFNPP Working Paper 113*, Cornell University, Food and Nutrition Program, Ithaca, New York.
- Goode, R. B. (1959). Adding to the Stock of Physical and Human Capital, *American Economic Review*, 49, 147-155.
- Gujarati, D. (2007). *Basic Econometrics*, Fourth Edition, Tata McGraw Hill education private limited, New Delhi.
- Hall, A. & Johnson, T. A. (1980). The Determinants of Planned Retirement Age, *Industrial and Labor Relations Review*, 33, 241-254.
- Handa, S., Simler, K. R. & Harrower, S. (2004). Human capital, household welfare, and children's schooling in Mozambique, Research Report 134, International Food Policy Research Institute.
- Ishikawa, M. & Ryan, D. (2002). Schooling, Basic Skills and Economic Outcomes, *Economics of Education Review*, 21, 231-243.
- Khandker, R. S., Lavy, V. & Filmer, D. (1994). Schooling and cognitive achievements of children in Morocco: Can the government improve outcomes? *World Bank Discussion Paper 264*. The World Bank, Washington, D.C.
- Long, J. S. (1997). *Regression Models For Categorical and Limited Dependent Variables*, SAGE Publications Inc. London, U.K.
- Mariara, J. K. & Mwabu, D. K. (2007). Determinants of school enrolment and education attainment: empirical evidence from Kenya, *South African Journal of Economics* 75, 572-593.
- Moyi, P. (2012a). Who Goes to School? School Enrolment Patterns in Somalia. *International Journal of Education Development*, 32, 163-171.
- Moyi, P. (2012b). School Enrollment and Attendance in Central South Somalia. SAGE Open October – December, 2012, 1-9.

- Ngware, M., Oketch, M. & Ezech, C. A. (2008). Do household characteristics matter in schooling decisions in Urban Kenya? APHRC, working paper No. 37
- Nielsen, H. S. (2001). How sensitive is the Demand for Primary Education to Changes in Economic Factors? *Journal of African Economies*, 10, 191-218
- Psacharopoulos, G. & Woodhall, M. (1997). *Education for Development; An Analysis of Investment Choice*. New York: Oxford University Press
- Rahji, M. A. Y., (2005). Primary school Enrollment and Gender Gap of rural household's children in South West Nigeria. Paper prepared for the Regional Conference on "Education in West Africa; Constraints and Opportunities in Dakar, Senegal November 1-2, 2005
- Ray, R. (2000). Child Labor, Child Schooling, and their Interaction with Adult Labor: Empirical Evidence for Peru and Pakistan, *World Bank Economic Review*, 14 , 347-367
- Riddell, W. C. (2004). The Social Benefits of Education, New Evidence on Old Questions, *Conference Paper*, University of Toronto, Canada
- Romer, P. (1990). Endogenous technological change, *Journal of Political Economy* 98 (5, part 2): S71–S102
- Samatar, A. I. (1988). *Socialist Somalia: rhetoric and reality*, London, Zed Books.
- Schultz, W. T. (1961). Investment in Human Capital. *American Economic Review*, 51, 1-17
- Schultz, T. P. (2004). Evidence of Returns to Schooling in Africa from Household Surveys: Monitoring and Restructuring the Market for Education. *Journal of African Economies*, 13, 95-148
- Sibanda, A. (2004). Who Drops Out of School in South Africa? The Influence of Individual and Household Characteristics, University of Pennsylvania, Population Studies Center
- Transitional Federal Republic of Somalia; Ministry of Education, Culture and Higher Education, Education Report School Year 2010-2011 – Somalia
- UNDP. (1997). *Population Statistics of Somalia*, Nairobi, Kenya

- UNESCO, Institute for Statistics. (2011). Financing Education in Sub-Saharan Africa , Meeting the challenges of expansion , Equity and quality, Montreal, Canada.
- UNESCO. (2005). Children out of school: Measuring exclusion from primary school. UNESCO Institute for Statistics, Montreal.
- UNICEF.(2007). Somalia 2006 Multiple Indicator Cluster Survey (MICS). UNICEF, Somalia.
- Walque, D. (2005). Parental Education and Children's Schooling Outcomes: Is the Effect Nature, Nurture, or Both? Evidence from Recomposed Families in Rwanda, World Bank Policy Research Working Paper 3483. Washington, DC.
- Weisbrod, B. A. (1966). Investing in Human Capital, *Journal of Human Resources*, 1, 5-21.
- World Bank (1995). World Development Report: Workers in an integrating world. (Baltimore, MD, Johns Hopkins University Press).
- World Bank, (2006). Somalia: From resilience towards recovery and development; A country economic memorandum for Somalia, Washington, DC
- World Bank, (2004). Determinants of primary education outcomes in developing countries , paper for the evaluation of the world bank's support for primary education , Washington DC.

APPENDIX

Table 1: Probit estimates for primary school enrollment in Somalia with interaction terms

Variables	Coefficient	Z- Value	P- value
Child characteristics			
Child age6-7* male	-0.438	-3.29	0.001
Child age8-9 * male	-0.287	-2.46	0.014
Childage10-11 * male	-.273	-2.25	0.025
Childage12-13 * male	-0.069	-0.54	0.591
Household characteristics			
Father's education level		-0.58	0.564
none* male	-0.138		
primary * male	0.100	0.42	0.675
secondary * male	0.223	0.90	0.369
tertiary * male	0.110	0.42	0.673
Mother's education level		0.94	0.347
none * male	0.252		
primary * male	0.030	0.11	0.914
secondary * male	0.085	0.29	0.768
tertiary * male	0.195	0.55	0.584
Household size * male	0.001	0.12	0.903
Community characteristics			
North east region * male	0.027	0.24	0.807
South central region* male	0.258	2.71	0.007
Rural residence * male	-0.176	-1.54	0.123
Time taken to fetch water * male	0.000	0.11	0.909
Wealth index* male	-0.164	-2.41	0.016
Child characteristics			
Child age (6-7)	-0.815	-8.78	0.000
Child age (8-9)	-0.405	-5.05	0.000
Child age (10-11)	-0.093	-1.12	0.265
Child age (12-13)	-0.116	-1.33	0.182
Male	0.407	1.11	0.268

Household characteristics			
Father's education level		-1.91	0.056
None	-0.322		
primary	-0.031	-0.19	0.850
secondary	-0.119	-0.69	0.492
tertiary	0.020	0.12	0.908
Mother's education level		-3.02	0.003
Non	-0.562		
primary	-0.067	-0.35	0.727
secondary	-0.119	-0.60	0.550
tertiary	-0.381	-1.55	0.121
Household size	0.007	0.62	0.535
Community characteristics			
Rural residence	-0.222	-2.87	0.004
North east region	0.300	3.83	0.000
South central	-0.027	-0.42	0.675
Time taken to fetch water	-0.000	-0.67	0.505
Wealth index	0.566	12.15	0.000
Constant	1.008	4.04	0.000
Number of observation	6278		
LR χ^2 (37)	2023.68 ; P-value(0.0000)		
Pseudo R ²	0.2391		
Log likelihood	-3220.0472		

Table 2: Probit estimates for primary school enrollment in Somalia

Variables	BOYS			GIRLS		
	Co-efficient	Z-value	P- value	Co-efficient	Z-value	P- value
Child age						
Child age (6-7)	-1.253	-13.15	0.000	-0.815	-8.78	0.000
Child age (8-9)	-0.693	-8.14	0.000	-0.405	-5.05	0.000
Child age (10-11)	-0.367	-4.17	0.000	-0.093	-1.12	0.265
Child age (12-13)	-0.186	-1.96	0.050	-0.116	-1.33	0.182
Household characteristics						
Father's Education level						
None	-0.461	-2.71	0.007	-0.322	-1.91	0.056
Primary	0.068	0.40	0.688	-0.031	-0.19	0.850
Secondary	0.104	0.58	0.560	-0.119	-0.69	0.492
Tertiary	0.131	0.70	0.486	0.021	0.12	0.908
Mother's education level						
Non	-0.309	-1.61	0.108	-0.562	-3.02	0.003
Primary	-0.037	-0.19	0.853	-0.067	-0.35	0.727
Secondary	-0.034	-0.16	0.869	-0.119	-0.60	0.550
Tertiary	-0.186	-0.73	0.468	-0.382	-1.55	0.121
Household size	0.009	0.79	0.428	0.0072	0.62	0.535
Community characteristics						
North east region	0.328	4.05	0.000	0.3005	3.83	0.000
South central	0.230	3.38	0.001	-0.027	-0.42	0.675
Rural residence	-0.399	-4.76	0.000	-0.223	-2.87	0.004
Time taken to fetch water	-0.0000644	-0.55	0.586	-0.000084	-0.67	0.505
Wealth index	0.401	8.00	0.000	0.566	12.15	0.000
Constant	1.416	5.23	0.000	1.0085	4.04	0.000
Number of observation	3245			3033		
LR X ² (18)	881.82 ; P-value (0.0000)			979.90; P-value(0.000)		
Pseudo R ²	0.2151			0.2332		
Log likelihood	-1609.2329			-1610.8143		

Table 3: Primary School Gross Enrolment ratio in African Countries (% Gross), 2007-2010

Countries	Total	Male	female
Algeria	108	111	104
Angola	128	141	114
Botswana	109	111	108
Burkina Faso	78	83	74
Burundi	147	149	144
Cameroon	114	122	106
Central African Republic	89	104	74
Chad	90	105	74
Congo	120	123	116
Côte d'Ivoire	74	81	66
Democratic Republic of the Congo	90	98	83
Djibouti	54	58	51
Egypt	101	103	99
Equatorial Guinea	82	84	80
Eritrea	48	53	44
Ethiopia	102	107	98
Gambia	90	88	91
Ghana	105	106	105
Guinea	90	97	83
Kenya	113	114	111
Lesotho	104	105	104
Madagascar	160	162	158
Malawi	119	118	121
Mali	95	103	86
Montenegro	112	113	111
Morocco	107	112	103
Mozambique	114	121	108
Namibia	112	113	111
Niger	62	69	55
Nigeria	89	95	84
Rwanda	151	150	151
Senegal	84	82	85
Sierra Leone	–	–	–
Somalia	33	42	23
South Africa	101	103	99
Swaziland	108	112	104
Togo	115	119	111
Tunisia	108	109	107
Uganda	122	121	122
United Republic of Tanzania	105	105	105
Zambia	113	113	112
Sudan and South Sudan	74	78	70

Source: World Bank (2012)