# PRIMARY SCHOOL ENROLMENT IN SOUTH-SUDAN: EVIDENCE FROM CROSS-SECTIONAL SURVEY DATA

NYANTIOP MARTHA AGOOT

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# DECLARATION

This research project is my original work and has not been done and presented in any institution before for awarding of a degree or any certificate.

**Nyantiop Martha Agoot**
Reg. No: X50/7197/2017

Signature………………………………… Date ………………………………………

This research project is submitted to me for examination for the award of a degree in Master of Arts in Economics.

**Prof. Damiano Kulundu**

Signature………………………………… Date ………………………………………

# DEDICATION

I dedicate this research project to Bona Alith Arou my closest friend, Khot Mike Bolyuot my husband and entirely family members for their encouragement and support.

## ACKNOWLEDGEMENT

# ABSTRACT

In spite of the important role of human capital investment in a country's socio-economic development, primary school enrolment in Sub-Sahara Africa and particularly in South-Sudan remains very low. This study examines the correlates of primary school enrolment rates in South-Sudan using a binary Probit regression model applied to a nationally representative cross-sectional survey of 3,550 households. We establish that individual, household and community factors are influential in the enrolment decision. In relation to individual correlates, we find that boys are 7.5% more likely to be enrolled than girls. Similarly, an additional year of a child's age increases enrolment by 4.9%. In terms of household correlates, we find that household size, asset ownership, paternal and maternal age and education are directly correlated with enrolment while inversely related to higher household expenditure. In terms of community characteristics, we observe that enrolment is inversely related to distance to the nearest school and being a rural resident. Finally, the evidence reveals the existence of wide regional and gender differentials in school enrolment in South-Sudan. Based on these findings we conclude that gender and regional gaps require intervention to avoid the negative externalities of low human capital on the economy and it is recommended that subsidization of primary education will ultimately incentive parents to enrol their children as the cost of enrolling a child will have been cutback. Similarly, the government needs to invest in the infrastructure and ensuring schools are within reach.

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**CHAPTER ONE**

**INTRODUCTION**

**1.      Introduction**

Investment in education is indispensable in achieving a country's development aspirations. Equally, it enhances an individual's earnings prospects. However, unlike in developed countries, investment in schooling in developing countries and more importantly in Sub-Sahara Africa remains low. According to the latest available estimates, the gross primary school education enrolment in Sub-Sahara Africa dropped between 2011 and 2015 to stand at 97.1% while secondary school enrolment over the same period increased to 43.5%. In addition, gender and regional differences in human capital investment across countries and within the countries in the region also exists and thus the continued existence of inequalities if not addressed will amplify inequality and entrench poverty levels in the continent.

After a prolonged period of conflict South Sudan's system of education is striving to meets its needs (UNESCO, 2017). However, its progress has been thwarted by high dropout rates, dismal enrolment rates in primary school among females than among males. Compared to that of Sub-Sahara Africa, South Sudan's enrolment rate is two times less. Indeed, the gross enrolment ratio in primary dropped from 84.8% in 2011 to 66.6% in 2015. Similarly, the school enrolment rate among males has dropped by 11% compared to a 6% drop in female enrolment rates between 2011 and 2015 though male's enrolment rate is still higher than that of females. This paints not only a possibility of the existence of pronounced gender disparities in the schooling behaviour in the country but also of different educational enrolment and more likely geographical disparities as well.

In South Sudan, the school enrolment rates are dismal and lower than the average enrolment rates in SSA. Similarly, gender and geographical differences in enrolment are

evident (**Figure 1.1**). For instance, in rural primary and secondary school enrolment is characterised by male dominance so is the case with urban primary and secondary enrolment. In terms of geographical, the statistics also reveal that that urban enrolment is higher than that of rural areas. This calls for the need for policy interventions to addresses the gender and geographical disparities and hence the need for the present paper.

**Figure 1.1. School Enrolment Rate in South-Sudan**
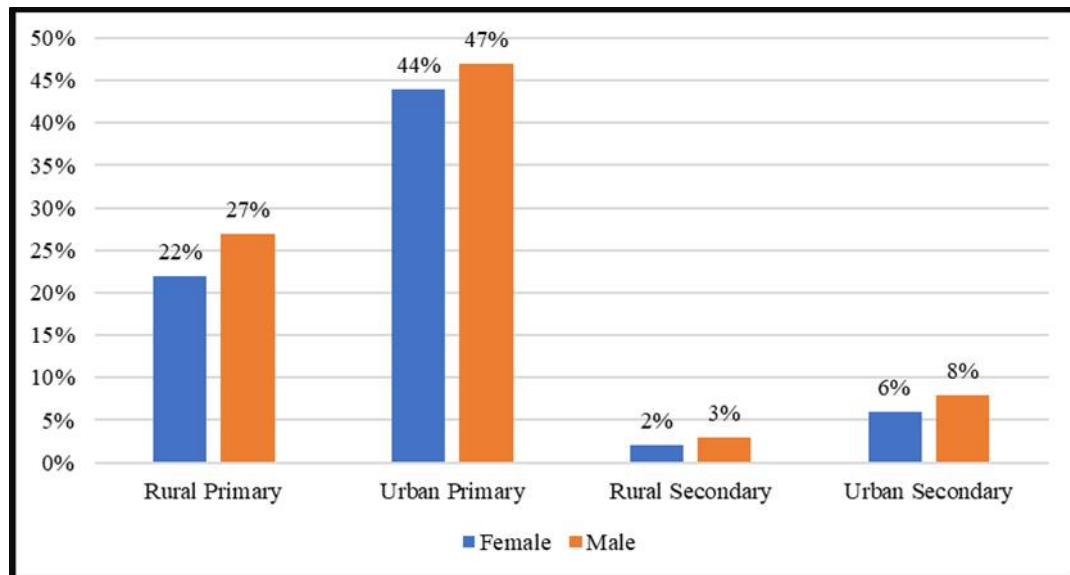


Source: IPUMS (2008).

### 1.1.1 Overview of Education System in South-Sudan

Several studies have underscored the important role of education in a country's socio-economic development. However, school enrolment levels in Sub-Sahara Africa remains low compared to those of other regions. Compared to that of Sub-Sahara Africa, South Sudan's enrolment rate is two times less.

Indeed, the gross enrolment ratio in primary dropped from 84.8% in 2011 to 66.6% in 2015 while secondary enrolment rose marginally over the same period from 9.1% to 9.9% though still very low. And following prolonged periods of internal strife, the country's education system has barely been non-existent and subsequently following the

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period of the Condominium rule, the education system in the country was never expansive to meet the needs of its populace.

After gaining independence in 2011, it adopted the 8-4-4 system of education (**Figure 1.2**). The country's Vision 20140 notes that during that period, the existing system meant to produce junior public servants and its focus being to ensure that few were literate in indigenous languages. As a result, the school enrolments given the inexistence of adequate infrastructural facilities in the country has been low though steadily picking momentum.

**Figure 1.2.  Structure of education system in South-Sudan**
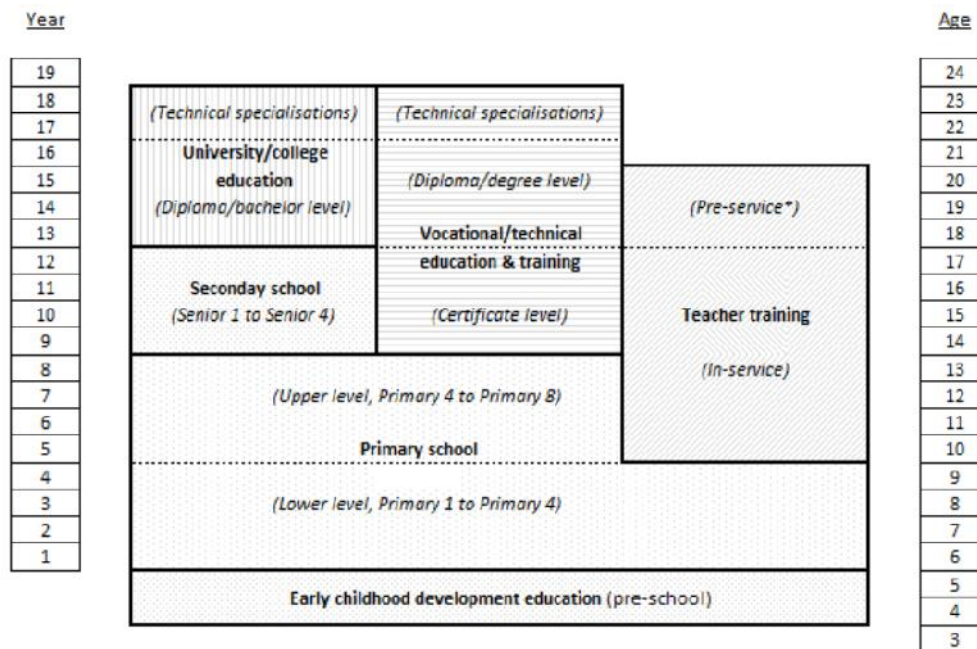


* Pre-service teacher training lasts three (3) years for P8 leavers and two (2) years for secondary leavers

The country's learning system aims to eradicate illiteracy among the young people and therefore increase their prospects of employability while promoting a culture of lifelong and continuous education for all. The education system, in addition, is meant to address inequity and inequality across gender while promoting cohesion and unity. However,

the ramifications of the long-protracted crisis in the country did great harm to the country's education system.

According to the Statistical Yearbook for Southern Sudan 2010, approximately 63% of children who should be in school were not enrolled, 68% of rural children were not enrolled. In 2018, the United Nation noted that consequent to the protracted crisis 48% of the country's schools are not functioning. Being a young system, several supply-side and demand-side challenges still inhibits the country from achieving higher school enrolment rates as those already achieved by other sub-Saharan African countries. Despite, the rates being low it's been improving in the recent past.

On the supply-side, schools are far from communities and even hard to access. In addition, the destruction of schools and the departure of teachers in conflict-affected areas exacerbates the dominance and continued prevalence of low school enrolment (UN OCHA, 2018). More importantly, inadequate capacity in the teaching fraternity. For instance, nearly half (i.e. 47%) of teachers have training.

On the demand side, the lack of resources due to the high incidences of poverty has resulted in families allocating fewer resources for the education of children. Cultural beliefs are also seen to be a barrier. Norms and cultural practices have delineated specific roles across gender with girls tending to be more burden with domestic duties and hence their low enrolment status. Even worse, the supply-side and demand-side barriers heighten the low enrolment rates among children with disabilities as the existing facilities do not take into consideration their specific needs either in terms of infrastructure or trained teachers that offer special education needs.

### 1.1.2   Overview of South-Sudan's Enrolments in Primary Education

After gaining statehood in 2011, South-Sudan has affirmed the integral role of schooling as contained in the Education Act whose guiding principles is ensuring free and compulsory primary education free of any racial, religious or ethnic prejudice. Even

though this is the case, the reality in the different states is at divergence with the principles of the Education Act.

Overall, the enrolment rates rose from 21% to 79% between 2000 and 2009 highlighting the country's commitment to ensuring access to education by all. Despite the stellar performance in school enrolment, there exist substantial disparities with the urban-rural disparity being evident. On the other, disparities along the rich-poor and the male-female dimensions as well as state-wise (**Figure 2**) and evidence of poor-urban disparities exist (**Figure 3**). As for boys and girls, the overall pattern reveals similar performance at the aggregate level though there exist disparities at the state level.

Despite, the marked heterogeneity in enrolment rates across states, gender and wealth, available statistics shows that the probability of children enrolled completing school also exhibits differences though over the past decade has been diminishing (World Bank, 2012). For instance, whereas 20% of the students are exit before completing the last grade in their primary education, 30% of the boys enrolled in school are more likely to complete the eight-year cycle compared to 17% among the girls.

| Figure 2: Disparities in Enrolment Across States | Figure 3: Disparities in Enrolment by Gender and Wealth |
| --- | --- |
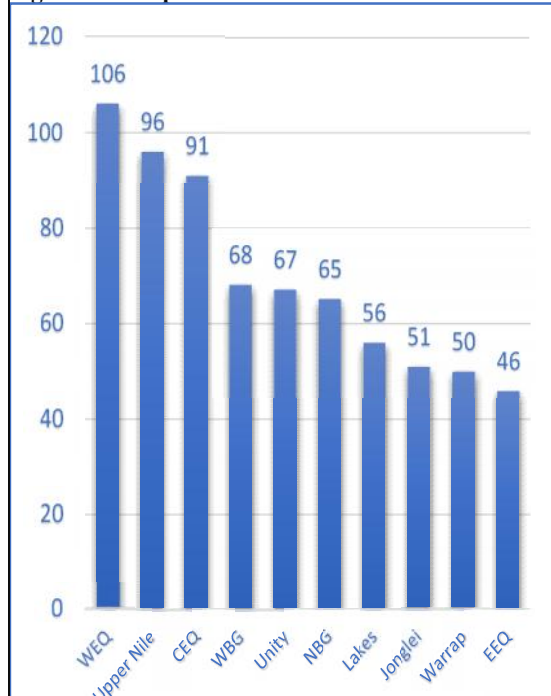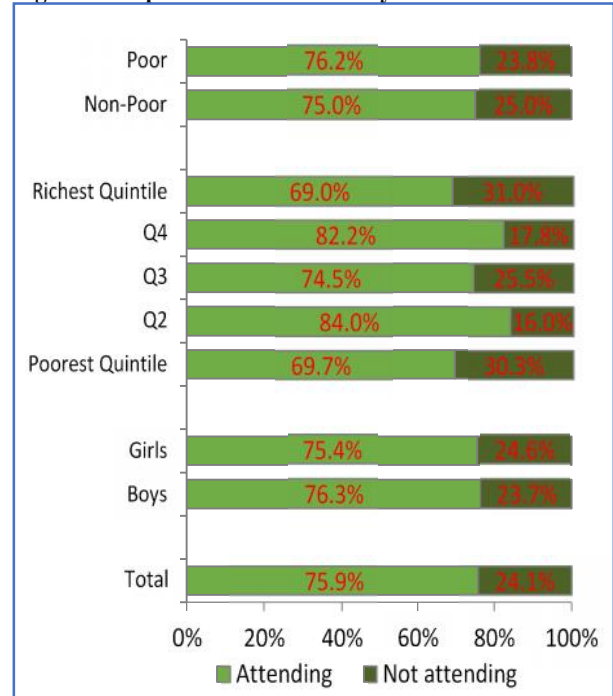


**Source: National Baseline Household Survey (2009)**

### 1.1.3   Overview Education Expenditure

South-Sudan's spending on education has been erratic and consistently declining and lower compared to those of countries such as Cameroon, Kenya, Ghana among others in Sub-Sahara Africa. For instance, the expenditure as a proportion of GDP between 2011 and 2017 was less than 5% (Table 1) in contrast with other countries whose educational expenditure as proportion of government expenditure stands at over 10% and has been on an upward trend. This pattern clearly shows that South-Sudan still has a lot to do in order to catch up with its regional peers.

**Table 1.1. The Proportion of Expenditure on Education**

|  | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| South Sudan | 3.95 | . | 3.23 | 4.13 | 3.28 | 0.85 | 1.07 |
| Cameroon | 14.87 | 15.18 | 13.82 | 12.93 | 13.24 | 12.69 | 15.47 |
| Cote d'Ivoire | 22.43 | 20.86 | 21.57 | 21.77 | 21.17 | 21.28 | 18.62 |
| Ethiopia | 29.67 | 30.54 | 27.02 | 25.92 | 27.1 |  |  |
| Kenya | 19.25 | 19.92 | 19.14 | 17.08 | 16.66 | 17.34 | 17.58 |
| Ghana | 30.63 | 37.52 | 21.22 | 20.99 | 23.81 | 22.09 | 20.1 |
| South Africa | 18.96 | 20.64 | 19.17 | 19.14 | 18.7 | 18.05 | 18.73 |
| Uganda | 13.61 | 11.45 | 11.74 | 10.88 | 12.14 | 11.38 | 12.01 |

*Data from database: World Development Indicators (2018)*

This low government spending on education is alarming and shows little commitment towards the sector by the government. Further Table 2 Shows that the spending on education in South-Sudan has experienced marked fluctuations and generally on a decline in 2017 compared to the level recorded in 2016. Even more surprising is the little levels of expenditure on schooling as a share of GDP considering the spending by other Sub-Saharan African Countries. Overall, this suggests that if South-Sudan must achieve the progress achieved by these countries in education and meeting the targets as laid out in the sustainable development goals, it must, therefore, seek to put more resources into the sector.

**Table 1.2. Education Expenditure to GDP**

|  | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| South Sudan | . | 1.08 | 1.52 | 1.36 | 1.50 | 0.98 |
| Cameroon | 2.70 | 2.77 | 2.69 | 2.77 | 2.69 | 3.08 |
| Cote d'Ivoire | 4.61 | 4.73 | 4.58 | 4.83 | 4.95 | 4.36 |
| Kenya | 5.51 | 5.42 | 5.28 | 5.27 | 5.36 | 5.24 |
| Ghana | 7.92 | 6.10 | 6.16 | 5.94 | 5.77 | 4.51 |
| South Africa | 6.37 | 6.01 | 6.05 | 5.96 | 5.94 | 6.13 |
| Uganda | 2.48 | 2.21 | 2.25 | 2.77 | 2.56 | 2.64 |

*Data from database: World Development Indicators (2018)*

## 1.2    Problem Statement

Several studies have underscored the central role of education in a country's socio-economic development however, school enrolment levels in South-Sudan remains low and is two times less compared to Sub-Sahara Africa's enrolment. In addition, the drop-outs levels remain high.  Even though few studies exist on the demand for schooling they are focussed on other contexts other than South-Sudan. For instance, the existing studies focus on Kenya, Uganda, Tanzania, Mozambique, Egypt. South-Sudan is unique as it relatively lags not only on primary school enrolment but also in government expenditure on education.

Similarly, the education system is very inequitable across regions, by gender and even based on the economic distribution. The system is also marked by the prevalence of repeat grades and thus putting a strain on the system more so on the funding requirements. The existing literature on this subject matter in South Sudan is nascent with the existing studies focussing on other regions other than South Sudan (see, for instance, Wilson, 2001; Cameron & Heckman, 2001; Michaelowa, 2001; Kabubo  mariara, & Mwabu, 2007; Jensen, 2010; Glick and Sahn, 2000; Handa, Simler & Harrower, 2004; Al- Samarrai and Reilly, 2000; Moyi, 2012; Kimenyi, Mwabu and Sandefur, 2011). Similarly, whereas several studies have examined the demand for schooling the empirical examination in developing countries is not new however, the findings of these studies tend to be context specific. Understanding the demand of primary schooling is therefore important for policy formulation as it is an important issue especially in the country's future stock of human capital.

**1.3    Research Objectives**

This study sought to analyse the correlates of primary school attendance in South-Sudan. More specifically;

i.    To investigate the correlates of primary school enrolment in South Sudan

i.    Draw policy inferences based on the findings obtained.

**1.4    Justification of the study**

Human capital investment is a crucial element for economic growth and development and equally important in poverty alleviation efforts. In the context of a post-conflict and fragile state like South-Sudan, the future path of the economy greatly depends on investing in progenies' s education and thus this study on the determinants of school enrolment rate is timely as it will policy formulation. Consequently, this study will contribute both to literature and policy on two fronts.

First, this study adds to the vast empirical works by empirically examining the correlates of primary school enrolment. In so doing the study will provide relatively new evidence in South-Sudan, a fragile and post-conflict state during the recent period by using the most recent household survey data conducted. This survey is suitable especially in a period where school enrolment rates both in primary are not only dismal but also lower and declining when compared to the average enrolment in SSA. Second, this adds to the burgeoning empirical studies that examine not only the role of child, parental but also community characteristics on school outcomes. This has the implication for policy formulation as it will highlight the factors that would require policy interventions to reverse the declining trend.

## 1.5     The organisation of the study

This paper has five chapters. Chapter one introduces and motivates the need for the study. In addition, South-Sudan's education system is also discussed as well as the objectives pursued by the study. The theoretical and empirical literature is presented in chapter two and in chapter three the research methodology is discussed. Chapter four presents the results and chapter five ends with the policy implications of the results.

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1    Theoretical Literature

Investment in human capital is often seen as a being key to bolstering an economy's growth and development (Almendarez, 2008) and is thus according to Gertler and Glewwe (1990) is to be viewed not only as being a consumer good but also a capital good. As a capital good, education adds to the stock of human capital through formal and on the job training and therefore is integral in boosting economic and social productivity (Almendarez, 2008). Just like any investment, human capital investment involves some initial sunk costs with the expectation of a return in some future date either in the form of increased wage expectations or higher firm productivity.

Unlike other assets, the returns on investment in human capital are equivalent to the labour supplied (Hall & Johnson, 1980) which according to the human capital theory of Becker (1964) and Mincer (1970) raises a worker's productivity and hence raises their lifetime income. In view of the theory, individuals are assumed to be utility maximisers. They are deemed to be maximising their lifetime stream of income whenever they make an investment choice (i.e. acquiring more education).

## 2.2    Empirical Literature

In West Africa, Glick and Sahn (2000) investigate the determinants of schooling enrolment, attainment and withdrawal through a gendered perspective lens using a binary Probit model controlling for household-level random effects. Their findings indicated that higher incomes led to significant improvement in girl's schooling but not among boys. Similarly, the find that higher paternal education improved both girl's and boy's schooling while that of the mother improved the girl's schooling enrolment only which affirms that in many African setups that maternal and paternal preferences influence school enrolment among girls and boys differently.

In Conakry Guinea, Handa, Simler & Haarrower (2004) investigated the gender differences in school enrolment and attainment. Using a binary Probit model they established that higher household incomes are associated with increased enrolment with evidence of higher enrolment among girls than boys when household incomes increased. Similarly, they find that higher education among fathers had a higher propensity of raising enrolment for both boys and girls while the mother's education had more influence on girl's enrolment status. This evidence affirms the differences in how the different levels of education affect the schooling of boys and girls differently.

Using Probit models Al- Samarrai & Reilly (2000) modelled primary school enrolment in Tanzania. Their findings showed that divergences in school enrolment in primary among rural and urban school-going children were observed. This difference was attributed to the differences in household incomes across the regions. In addition, they also found that the child's age was positive and significantly influenced the prospect of being enrolled among both boys and girls. Similarly, this relationship is not linear rather concave an indication that beyond a certain age threshold the probability of enrolling also declines.

Using cross-sectional and pseudo panel data, Bedi, Kimalu, Manda & Nafula (2004) examined the correlates of primary school enrolment in Kenya. From their study, they find that the increased cost of attending school (i.e. the direct and indirect costs) and consequently the reduced expected benefits from school attendance served as a shock on school enrolment. Second, they observe that in urban areas the prevalence of HIV/AIDs also played a central role in explaining the trend waning in primary school enrolment rate.

Bold, Kimenyi, Mwabu and Sandefur (2011) using a multinomial logit model examined the determinants of primary school enrolment rate. According to the study, the introduction of free primary education in 2003 together with parental income and education play a less significant role in predicting primary school enrolment rates. However, in the pre-free primary school policy period, they establish a significant positive association between the head's level of education and the probability that a child would enrol in primary school. They establish that an extra year in school by the head shove up enrolment by 0.8 %, but the effect was reversed with the introduction of free primary education program by the government. Similarly, an additional education year and a child's age increased school enrolment.

In Tanzania, Alsamarrai & Peasgood (1998) using household survey data estimated a logit model to examine how household and individual characteristics affect a child's school enrolment, attendance and completion. Their results show the existence of substantial intra-household differences in how household covariates affect school outcomes among boys and girls. In addition, they show how differences in parental education influences schooling outcomes among boys and girls. For instance, they document that the father's level of education greatly influenced the boy's education while a mother having primary education greatly influenced girl's education. In addition, they show that a married mother's level of education increased the girl's enrolment in secondary school by 9.7% while secondary education of the mother increased school enrolment of girls in secondary school further by 17.6% while having no significant effect on the boy's educational enrolment. Like is the case in most African countries, these findings provide support for differences in maternal and paternal preferences in education levels among girls and boys.

In rural Egypt, Dancer and Rammohan (2007) analyzed the drivers of the divergent school enrolment and attainment among boys and girls using multinomial logistic regression. First, they find that girls are less likely to be in school with the disparity more pronounced in Upper Rural Egypt than in the other regions. Second, they establish that higher education attainment by the father of the child was correlated with being enrolled in school for both genders while that of the mother had a higher effect on the enrolment status of girls and not boys by approximately 60%.

Investigating the correlates of enrolment in India Jayachandran (2002) estimates a random effects panel data model and observe several factors to be correlated with the schooling decision. First, they find that labour force participation among adult females is positively correlated with school attendance which is attributed to the increased intra-household decision-making process. Second, they find that parental education is vital in the child's school attendance. That is the more educated a parent is the more likely that they will send their children to school relative to non-educated parents. Unlike previous studies that find maternal and paternal divergences in the schooling patterns of children of both genders they find that same-sex effects are stronger than cross-sex effects. That is the higher the level of education of the females, the higher is the likelihood of girls being enrolled in school. This is also the case with higher levels of education of the males which was also associated with higher likelihood of boy's enrolment in school. On the supply side, they show that school accessibility influenced enrollment and attendance and hence affirming the importance of school access in the participation or rather enrolment decision. Among other findings, they show that poverty and household size reduce the probability of being enrolled in school. Similarly, they also find evidence of the existence of gender bias in school attendance with boys being more likely to be enrolled relative to girls. However, gender bias tends to decline as parental education also increased.

According to a study by Nilesen (2001) conducted in Zambia, they found several attributes affecting enrolment status. First, they show that an increase in a child's age reduces the propensity of being enrolled. Second, the study finds evidence that higher household expenditure a proxy for income is associated with higher chances of being enrolled in school. With respect to community attributes, the study finds that the cost of transportation is negatively correlated with schooling while the presence of a school within the community led to improvement in schooling enrollment. More importantly, they also observed that the presence of a good infrastructure increased school enrolment among boys in rural areas.

Wahba (2006) using data from Egypt examines the role of adult market wages and parents who were child labourers on their children's school enrolment and child labour. They show that parental characteristics play a significant role in the joint determination of school enrolment and labour force participation. First, the study finds evidence that parents who were once child labourers have a higher propensity of sending their children to work than having them enrolled in school. They also show that a father's employment status and particularly in the private sector is associated with the probability of a child being enrolled. On the other hand, they also find evidence that the less educated parents were the more likely to have their children engaged in labour while investing less in schooling. As is the case with other studies conducted in the African context, they also find evidence of parental preferences in education status of children with the father's education affecting boy's school enrollment than mother's education while the opposite applies for the girls. In terms of other household characteristics, the find that male-headed household heads are more likely to have their children enrolled compared to non-male headed households. On the other hand, they also observe that the younger siblings a household had, the lower the odds of schooling among the children and the higher the likelihood of child labour.

In Turkey, Tansel (2000) investigated the correlates of school attainment by gender where he finds the existence of regional effects in school enrolment with girls in the South Eastern region of Turkey being more likely to drop out of school relative to those of other regions. In addition, they also find that individual and household factors influence the school attainment of children. For instance, they find that household income, parental education and occupation, as well as community characteristics, positively influenced the level of educational attainment.

In Rural South Western Nigeria, Rahji and Falusi (2005) established that boys were more likely to attend school than girls and this was driven by the cultural norms and beliefs that often tend to consider investment in boy's education is better than that of girls. In a study in Somalia, Moyi (2012) found that boys were more likely to be enrolled in school than girls. Similar evidence by Glick and Sahn (2000) in Guinea showed that girl's schooling was considered irrelevant and therefore not supported compared to boys. On the other hand, the literature shows that parents often attach more preferences to the male child's education compared to that of females and this they attributed to the labour market return for females being low as they are discriminated against. Another reason that has often been fronted on the low investment in the girl child is the often-daunted proposition that lower remittances are expected from them compared to the boy child.

## 2.3    Overview of Literature

Several studies that examine the demand for schooling and the literature reveals that school enrolment is determined by individual, household and community factors by applying discrete choice models. Several of the studies reviewed applied either logit or Probit models to analyse the enrolment decision. A view of the studies uses the instrumental variable 2SLS approach to address the endogeneity in the enrolment decision. In terms of the factors individual characteristics, age and gender are established as key in influencing the enrolment decision.

Among the household attributes, the empirical evidence suggests that increases in household income are associated with increased enrolment. Similar observations are made with respect to the mother and father's level of education though with marked differences for boys and girls. In addition, community attributes are also established as key in influencing enrolment. For instance, several studies show that the distance to school plays an important role in determining whether children enrol in schools on not.

More importantly the empirical examination of the determinants of schooling enrolment in developing countries and especially in developing context is not new however, the findings of these studies tend to be context-specific and hence the need to conduct empirical examination at the country level in order to establish those factors that can be targeted through policy to increase enrolment rates. Whereas several of the reviewed studies have looked at the determinants of school enrolment in different jurisdictions there is a clear lack of empirical evidence in the case of South-Sudan. More importantly, several studies have failed to consider the role of supply-side characteristics such as distance to the nearest school and availability of usable roads within the community, yet they are key to influencing enrolment decisions. To address this shortcoming, this study includes several supply-side and community characteristics in the enrolment decision.

## CHAPTER THREE

## RESEARCH METHODOLOGY

### 3.1 Theoretical framework

The demand for schooling can be seen from two perspectives: (i) as an investment in human capital; and (ii) as a consumption good. From the two respects, schooling presents a trade-off in the sense that schooling results in future income stream (Nielsen, 2001). Theoretically, the demand for schooling is utility deriving for the parents (Glick & Sahn, 2006). In making the choice of whether to enrol or not, parents consider the utility of having the child enrol in school vis-à-vis having the child not being in school.

To model the schooling decision, we assume that the supply of schooling is unconstrained and in the spirit of Strauss and Thomas (1995), the demand of schooling is thus modelled within the confines of the economic model of a household's behaviour which is influenced by the household's utility. The functional form of the utility of a household conditional of a child being enrolled can thus be expressed as:

$$U_i = U(S_i, C_i) + \varepsilon_i \qquad (1)$$

$U_i$ denotes the utility from derived from investment in human capital $(S_i)$ which comprises of both the monetary and non-monetary costs of school enrolment. $C_i$ is the consumption of non-human capital goods and services. $\varepsilon_i$ is a random shifter of the utility function.

Based on the functional form in equation (1) there are two possible outcomes, enrolment and non-enrol of a child in a school which yields different utility. Equation (2) below presents the functional form of the utility when the household chooses not to have the child enrol in school.

$$U_0 = U(C_0) + \varepsilon_0 = U(0, C_0) + \varepsilon_0 \qquad (2)$$

$$U_s = U(S_0 \, C_0) + \varepsilon_0 = U(S_0, C_0) + \varepsilon_0 \qquad (3)$$

Nonetheless, the maximisation of the utility function in equation (2 & 3) above is subject to an income/budget constraint of the form;

$$C_i + P_i = C_0 = Y \qquad (4)$$

In equation (4), $P_i$ is the total cost associated with a child's school attendance and comprises of both the monetary and non-monetary costs while $Y$ is the household's disposable income. Equation (2) and equation (3) combined and optimised subject to the income constraint in equation (4) is expressible as;

$$U^* = Max(U_0, U_s) \qquad (5)$$

In equation (5) above $U^*$ is the maximum utility, $U_0$ is the utility from non-enrolment and the consumption of non-schooling good and $U_s$ is the utility with school enrolment.

## 3.2    Econometric model

The optimisation of the household utility function is however constrained by income. If the utility function is twice differentiable and continuous the optimisation yields the conditional demand for schooling which is binary in nature. This demand function is, therefore, a function of household income, which is proxied by the real household per capita expenditure $X_i$. It is also influenced by a vector of household's demographics $D_i$ and a vector of village-level infrastructure $I_i$. The demand for schooling function can be therefore modelled as;

$$Pr(Y_{iA} = 1) = \emptyset[X_i\beta] \qquad (6)$$

Where equation (6) gives the function where the child is enrolled in school against the non-enrolment function presented in equation (7);

$$Pr(Y_{iA} = 0) = 1 - \emptyset[X_i\beta] \qquad (7)$$

The parameter of interest in the estimation is $\beta$ which gives the determinants of school enrolment among school-age children. Combining equation (6) and (7) yields the empirical model presented in equation (8);

$$Y_i = \alpha + \beta_i X_i + \beta_i Z_i + \beta_1 \pi_i + \varepsilon_i \qquad (8)$$

In Equation (8), $Y_i$ is the schooling status variable and it takes a value 1 if the child is enrolled in school, zero otherwise. $X_i$ is a vector of a child's attributes, $Z_i$ is a vector of household attributes and $\pi_i$ denotes the vector of community attributes, $\varepsilon_i$ captures the error term which is assumed to be normally distributed.

**Table 3.1.  Variable definition and Measurement**

| Variables | Description and Measurement |
|---|---|
| **Dependent Variables** | |
| Enrolment status | Equals 1 if the individual is currently enrolled in school, 0 otherwise |
| **Explanatory Variables** | |
| **Household and individual characteristics** | |
| Household size | Captured by the total number of individuals living in the household |
| Household expenditure | A proxy for income and measured by the natural logarithm of the real per capita household consumption expenditure |
| Mother's schooling | Equals 1 if the mother has at least completed one level of education, 0 otherwise. i.e. 1 if the mother has at least primary education, 0 otherwise. |
| Father's schooling | Equals 1 if the father has at least completed one level of education, 0 otherwise. i.e. 1 if the father has at least primary education, 0 otherwise. |
| Gender | Equals 1 if the individual is male, 0 otherwise |
| Age | Measured in years |
| Land | Measured in hectares per adult member living in the household. |
| Livestock | Measured in standardised livestock units owned by a household. |
| Number of adult males | Defined as the total of all males over 18 years of age living in within the household |
| Number of adult females | Defined as the total of all females over 18 years of age living in within the household |
| Mother's age | Age of the mother in years |
| Father's age | Age of the father in years |
| **Village/Community characteristics** | |
| Distance | Distance to the nearest primary school in kilometres |
| Access to Piped water | Equals 1 if the village has access to piped water, 0 otherwise |
| Access to Electricity | Equals 1 if the village has access to electricity, 0 otherwise |
| Geography | Defines the area of residence the individual resides in whether urban (1) or rural (0). |

## 3.3    Data

The data used is South Sudan High-Frequency Survey (SSHFS). This survey is a nationally representative survey conducted between August 2012 and September 2014 by the World Bank and National Bureau of Statistics of South Sudan. The administration of the survey was through a stratified two-stage sampling approach with 3550 households being interviewed. This survey provides extensive information on education, household and other socio-economic characteristics.

## 3.5    Diagnostic Tests

In order to ensure the estimates from the estimation of equation (2) in Section 3.3, and in line with panel data estimation technique, the study will carry out a battery of tests to ensure robustness and reliability of the estimates. In particular, the study tested for multicollinearity, heteroscedasticity and normality. The motivation of the need to undertake these tests are presented in the following

### 3.5.1    Testing for Multicollinearity

Embedded in the econometric practice is the need to ensure that variables that enter any regression do not suffer from being highly correlated. In the spirit of this, the study will test for multicollinearity by using the Pearson correlation coefficients and the variance inflation factor. In line with the extant literature any Pearson correlation amongst the variables in excess of 0.7 will be dropped from the model. When using the variance inflation factors any variable that will have variance inflation factor beyond 10 (Montgomery (2001) and Gujarati (2003) will also be dropped from the regression model as their inclusion in the model weakens the model's power and the preciseness of the model's coefficients.

### 3.5.2    Testing for heteroskedasticity

Key in cross-sectional models is the assumption of error terms being spherical (i.e. they should have a constant variance). To test whether this assumption holds, the Breusch-Pagan LM test for heteroskedasticity. Under this test, the null hypothesis states that the error terms are homoscedastic (i.e. have a constant variance) against the alternative hypothesis that the error terms heteroscedastic (i.e. have non-constant variance). If the error terms are established to be heteroscedastic this will be remedied by adopting the Huber-Sandwich estimator and the robust standard errors reported.

## CHAPTER FOUR
## EMPIRICAL FINDINGS & DISCUSSIONS

### 4.1.    Summary Statistics

A look at enrolment rates by gender, residence, wealth status and age of the child are presented in Table 4.1 to Table 4.4 and they present interesting insights. From Table 4.1 we make two inferences. First, gender disparities exist. That is, the proportion of boys enrolled is 6% higher than that of girls. Second, geographic disparities exist with enrolment in among children from urban households' urban areas being 27% higher than children from rural households.

**Table 4.1. Enrolment rate by sex and place of residence**

| Variables/Description | N | Mean | Standard Deviation |
|---|---|---|---|
| Girls | 2,795 | 0.591 | 0.492 |
| Boys | 2,707 | 0.659 | 0.474 |
| Urban | 2,067 | 0.792 | 0.524 |
| Rural | 3,435 | 0.524 | 0.499 |
| Total | 5,502 | 0.625 | 0.484 |

*Note: The summary statistics are the unweighted averages*

In terms of the wealth status, as presented in Table 4.2 we observe a higher propensity among children from the poor (i.e. lowest quintile) than in wealthier families of being enrolled. To confirm this difference, we adopt a two-sample t-test with equal variances and establish indeed that children from the poor have higher enrolment rates than those from wealthier families. We collapse the wealth quintiles into two; poor; below 50th percentile and the rich; above 50th percentile. The proportion of enrolment among the poor households is 66.8% and 58.1% among the wealthy households with a difference of 8.7% with a t-test statistic of 6.6599 being statistically significant at 1%. This could be because of the more children among families of lower wealth status relative to the rich households and hence the skewed distribution of the primary school enrolment among the children.

**Table 4.2. Enrolment rate by wealth quintiles**

| Description | N | Mean | Standard Deviation |
|---|---|---|---|
| Poorest (0-25$^{st}$ percentile) | 1,348 | 0.693 | 0.461 |
| Poor (25-50$^{st}$ percentile) | 1,422 | 0.644 | 0.479 |
| Rich (50-75$^{st}$ percentile) | 1,338 | 0.596 | 0.491 |
| Richest (above 75$^{st}$ percentile) | 1,394 | 0.567 | 0.496 |

*Note: The summary statistics are the unweighted averages*

As figure 4.1 below shows, at the age of 6 only 38.17% of the children were enrolled. More evidently is the fact that enrolment in primary school seems to rise as the child gets older with 80.6% of those aged 13 years were enrolled in primary school. What this implies is that with the lower enrolment at the age of six, which is the entry age to standard one, a significant number of children do not complete formal primary schooling at the age of 13.

**Figure 4.1. Enrolment rates by child age**
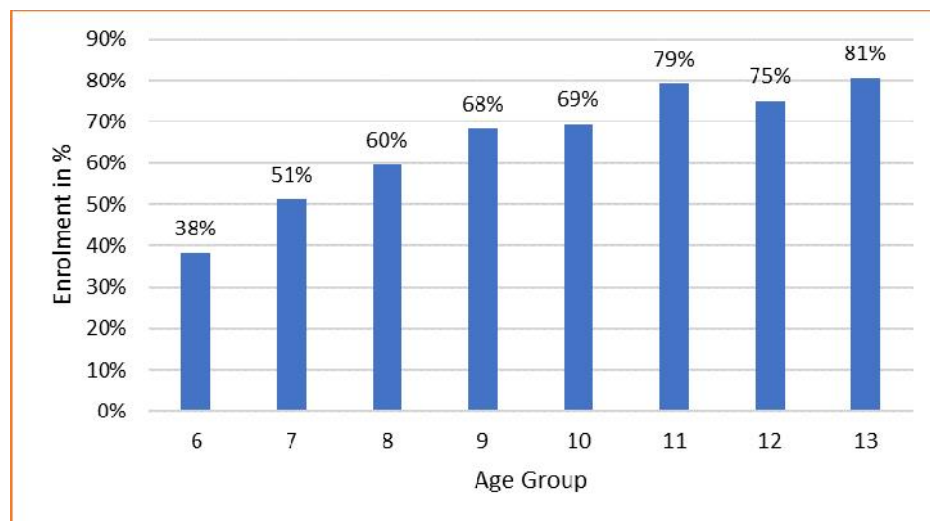


From Table 4.3 we observe that 63% of the children aged between 6-13 years are currently enrolled in primary school. In addition, the sample is made up of 51% of boys and 49% girls. On the other hand, the average age of the children in the sample is 9 years with 62% of them residing in rural areas while 38% reside in the urban areas. In

terms of the paternal and maternal level of education, we observe that majority of the mothers have some form of secondary education while for the father's majority have primary education.

In terms of land ownership, we observe that 19% have a title to the land they are staying in. the results further show that the average age of the fathers of the children in the sample is 28 years while that of mothers is 17 years. In terms of the community characteristics, we find that the average time spent to the nearest water source is 49 minutes while the distance to the nearest school primary school is 0.87 hours (equivalent to 52 minutes). These two measures; time to the nearest source of drinking water and the distance to the nearest school represents are often considered as proxies for opportunity costs and the higher the time spent, the more they are barriers to school enrolment.

**Table 4.3. Summary Statistics**

| Variable | N | Mean | S.D | Min | Max |
|---|---|---|---|---|---|
| **Individual characteristics** | | | | | |
| Enrolment status (=1 if enrolled, 0 otherwise) | 5502 | 0.63 | 0.48 | 0.00 | 1.00 |
| Gender (=1 if male, 0 otherwise) | 5510 | 0.51 | 0.50 | 0.00 | 1.00 |
| Child's age in years | 5510 | 9.11 | 2.28 | 6.00 | 13.00 |
| **Household characteristics** | | | | | |
| Residence (=1 if rural, 0 otherwise) | 5510 | 0.62 | 0.48 | 0.00 | 1.00 |
| Mother's education level | 5510 | 3.65 | 0.87 | 1.00 | 4.00 |
| Father's education level | 5508 | 2.91 | 0.37 | 1.00 | 3.00 |
| Household expenditure per capita (log) | 5498 | -0.18 | 0.85 | -3.50 | 2.82 |
| Land ownership (=1 if owns land, 0 otherwise) | 5496 | 0.19 | 0.39 | 0.00 | 1.00 |
| Father's age | 4094 | 28.00 | 19.53 | 0.00 | 95.00 |
| Mother's age | 4808 | 17.38 | 13.89 | 0.00 | 95.00 |
| **Community characteristics** | | | | | |
| Time spent getting water (mins) | 5485 | 49.26 | 70.98 | 0.00 | 1440.00 |
| Time to the nearest primary school (hours) | 4989 | 0.87 | 1.07 | 0.02 | 26.63 |
| Northern Bahr El Ghazal | 5510 | 0.17 | 0.38 | 0.00 | 1.00 |
| Western Bahr El Ghazal | 5510 | 0.16 | 0.36 | 0.00 | 1.00 |
| Lakes State | 5510 | 0.22 | 0.42 | 0.00 | 1.00 |
| Western Equatoria | 5510 | 0.13 | 0.34 | 0.00 | 1.00 |
| Central Equatoria | 5510 | 0.16 | 0.37 | 0.00 | 1.00 |
| Eastern Equatoria | 5510 | 0.16 | 0.36 | 0.00 | 1.00 |

## 4.3. Correlation Matrix

The results in Table 4.4 unearth that the association amongst the coefficients of the variables are all below 0.7 and we, therefore, conclude that multicollinearity is not an issue in our analysis. Thus, all the variables can enter the econometric model without any issues of multicollinearity being encountered.

**Table 4.4. Correlation Matrix**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Enrolment status | 1.000 | | | | | | | | | | | |
| (2) Child's age | 0.273* | 1.000 | | | | | | | | | | |
| (3) Gender | -0.070* | -0.000 | 1.000 | | | | | | | | | |
| (4) education of mother | 0.115* | -0.009 | -0.002 | 1.000 | | | | | | | | |
| (5) education of father | 0.120* | -0.006 | 0.005 | -0.100* | 1.000 | | | | | | | |
| (6) father's age | 0.032* | 0.072* | 0.013 | 0.099* | 0.278* | 1.000 | | | | | | |
| (7) mother's age | 0.122* | 0.100* | -0.016 | 0.261* | 0.141* | 0.411* | 1.000 | | | | | |
| (8) Household per capital expenditure | -0.082* | -0.023 | 0.029* | -0.127* | -0.097* | -0.109* | -0.120* | 1.000 | | | | |
| (9) land ownership status | 0.045* | 0.020 | -0.016 | 0.004 | -0.004 | 0.029 | 0.002 | -0.206* | 1.000 | | | |
| (10) Residence | 0.269* | 0.073* | -0.008 | 0.101* | 0.099* | 0.070* | 0.151* | -0.116* | 0.011 | 1.000 | | |
| (11) time to getting water | 0.026 | 0.004 | -0.001 | 0.003 | 0.002 | 0.037* | -0.012 | -0.053* | 0.427* | 0.003 | 1.000 | |
| (12) time to nearest primary school | -0.004 | -0.005 | 0.026 | 0.001 | 0.001 | 0.025 | -0.013 | -0.042* | 0.003 | 0.002 | 0.447* | 1.000 |

## 4.4 Results and Discussions

### 4.4.1 Analysis of the determinants of primary school enrolment status

The results presented in Table 4.5 are of the baseline regression estimates (Column 1) which are from the linear probability model (i.e. OLS estimation). In Colum (2) the estimates of the probit estimator by the maximum likelihood method are presented and in column (3) the results of the marginal effect are presented. As for the probit estimates, we interpret the marginal effects.

In terms of child characteristics, the results offer interesting insights. First, we find that holding other factors constant, being male increased the likelihood of being enrolled 7.5% than females with the relationship being significant at 1%. This implied that boys were more advantaged in terms of school enrolment as compared to girls in line with the literature (Kazeem et al., 2010, Wells, 2009). This could be attributed to negative cultural norms and beliefs that downplay the importance of educating girls. More preference is on the male child's education due to the perceived low labour market return from investing in a female child's education. Furthermore, the belief that girls are meant to get married after all and the household responsibilities they are tasked to undertake such as taking care of their siblings heavily weighs down on the girl child education.

Second, we find that an additional age of the child increases the propensity of being enrolled by 4.9%. Even though there is no age limit to school enrolment, beyond a certain age limit child may deem themselves too old to enrol in school due to the natural psychological attitude. Nonetheless, an additional year, especially within the school age confinements, increases a child's propensity of being enrolled due to improved maturity which is seen through the development of a child's brain. Similarly, elder children can walk to school distance notwithstanding.

In terms of household characteristics, several equally interesting and intuitive insights are obtained. First, we find evidence that in terms of household size, an additional household member increased the probability of primary school enrolment by 0.6% ceteris paribus. The larger the size of the household, the higher the chances of a child enrolling in a primary school. Household size was found to be statistically significant at 10%. The result is counterintuitive and contrasts the normal perception that as the number of members in a household increases the higher the household expenditures on food, health, water etc. hence less or none of the income is devoted to school enrolment. More household members would also imply increased educational expenses in the form of tuition fees, school feeding program and some instances transportation costs. This finding is largely consistent with the strand of literature that has often found that the larger the family size the higher the school enrolment (Al-Samarrai &amp; Reilly, 2000). On the contrary, this conflicts with the other strand in literature that finds that larger families are often associated with a lower likelihood of a child being enrolled in school (Wells, 2009, Huisman and Smits, 2009, Eloundou-Enyegue and Williams, 2006).

Second, we observe that the higher the household expenditure, the less likely it is for a child to enrol in primary school. A one shilling increase in the per capita household expenditure decreased the probability of a child enrolling in a primary school by 1.1% ceteris paribus. This is because any extra income generated by a given household is absorbed by other household bills such as food, health, water and electricity. There is very little income left behind that could be possibly channelled towards educational expenses which entail not only tuition fees but also transportation and upkeep costs for the child while in school. This may be further aggravated by school maintenance costs in some cases, especially for the private school-going children.

In terms of the paternal and maternal education we find that higher education of the father and the mother is associated with a higher propensity of a child being enrolled in school, in particular, an additional year of education for the mother increased the likelihood of a child enrolling in school by 24.1% while an extra year of education of the father increases a child's enrolment by 13.7% which is consistent with the findings of Kazeem et al., (2010), Baschieri and Falkingham, (2009) who also established that higher parental education attainment is often associated with a higher likelihood of a child being enrolled in school as educated parents are more literate and empowered enough to understand the value and the expected return from investment in child schooling.

Holding other factors constant, a household that owned land was more likely to have their children enrol in school by 1.4% as compared to a household that did not own any land. Land ownership was used as a wealth index. This implied that owning land provided an opportunity of relaxing basic household expenditures on food through farming. By offsetting these expenditures, part of the income would then be devoted to school enrolment. In terms of age of the father and mother we find that a one-year increase in the father's age was surprisingly found to decrease the likelihood of a child enrolling in school by 0.1% while a one-year increase in the mother's age increased the likelihood of a child enrolling in school by 0.1% (from a male perspective) ceteris paribus.

As for the community characteristics, several insightful findings emerge. First, children from urban households have a higher probability of being enrolled in school compared to children from rural households which could be attributed to the proximity to schooling facilities. Similarly, better infrastructural facilities such as good roads in urban areas tend to increase primary school enrolment among children.

From the gender perspective, a male child is more likely to enrol in school by 11.6% as compared to a female child at 11.4% ceteris paribus. The time taken to the nearest source of water was found to be statistically insignificant. Further, the results show that a one hour increase in the time taken by a child to reach a primary school decreases the probability of a child enrolling in school by 0.6% ceteris paribus. The farther the school is, the more the time needed by the child to cover to reach the learning facility hence the lower the chances of the child enrolling in school (Kazeem et al., 2010, Baschieri and Falkingham, 2009; Filmer (2007). Girls are even more disadvantaged with regards to distance when compared to boys. The longer the distance the riskier it is for the girl child due to security concerns. This is true especially for the case of schools that are difficult to access due to poor roads.

Holding other factors constant, a child was less likely to enrol in a school located in Northern Bahr el Ghazal, and Lakes State by 7.3% and 8.6% and respectively. Northern Bahr El Ghazal and Lakes State were found to be statistically significant at 1%. In addition, a child was more likely to enrol in a school located in Western Equatoria. Female children were also less likely to enrol in schools located in Northern Bahr el Ghazal, and Lakes State when compared to boys. Furthermore, school enrolment among children was considerably lower in the rural areas of Northern Bahr El Ghazal, Western Bahr El Ghazal and Lakes State as compared to the urban counterpart states. School enrolment was likely to be higher (by 20.3%) in the urban area of state four but considerably lower in State.

**Table 4.5. Correlates of primary school enrolment in South-Sudan**

| | (1)<br>Pooled OLS | (2)<br>Probit | (3)<br>Marginal Effects |
|---|---|---|---|
| Constant | -0.158*** | -2.184*** | |
| | (-4.18) | (-15.62) | |
| **Individual characteristics** | | | |
| Child's age | 0.050*** | 0.171*** | 0.049*** |
| | (15.34) | (14.84) | (0.00) |
| Gender (=1 if male, 0 otherwise) | 0.075*** | 0.260*** | 0.075*** |
| | (5.16) | (5.20) | (0.01) |
| **Household Characteristics** | | | |
| Household Size | 0.007** | 0.021** | 0.006* |
| | (2.54) | (2.18) | (0.00) |
| Per capita household expenditure | -0.010 | -0.037 | -0.011 |
| | (-1.04) | (-1.13) | (0.01) |
| Education of the mother | 0.270*** | 0.835*** | 0.241*** |
| | (16.32) | (16.03) | (0.01) |
| Education of the father | 0.151*** | 0.474*** | 0.137*** |
| | (8.92) | (8.75) | (0.02) |
| Land ownership (=1 if owns land, 0 otherwise) | 0.014 | 0.047 | 0.014 |
| | (0.65) | (0.64) | (0.02) |
| Age of the father | -0.002*** | -0.005*** | -0.001*** |
| | (-3.86) | (-3.64) | (0.00) |
| Age of the mother | 0.000 | 0.000 | 0.000 |
| | (0.31) | (0.07) | (0.00) |
| **Community characteristics** | | | |
| Time to the Nearest Primary School | -0.005 | -0.022 | -0.006 |
| | (-0.54) | (-0.70) | (0.01) |
| Time taken to the nearest source of water | 0.000** | 0.001 | 0.000 |
| | (1.97) | (1.63) | (0.00) |
| Residence (=1 if urban, 0 otherwise) | 0.108*** | 0.405*** | 0.117*** |
| | (6.06) | (6.31) | (0.02) |
| Northern Bahr El Ghazal (State 1) | -0.076*** | -0.252*** | -0.073*** |
| | (-3.34) | (-3.48) | (0.02) |
| Western Bahr El Ghazal (State 2) | -0.054 | -0.234* | -0.068 |
| | (-1.46) | (-1.71) | (0.04) |
| Lakes state (State 3) | -0.095*** | -0.298*** | -0.086*** |
| | (-4.54) | (-4.38) | (0.02) |
| Western Equatoria (State 4) | 0.161*** | 0.606*** | 0.175*** |
| | (6.77) | (6.38) | (0.03) |
| Central Equatoria (State 5) | 0.035 | 0.213 | 0.062 |
| | (1.01) | (1.39) | (0.04) |
| *N* | 3301 | 3301 | |

*t* statistics in parentheses
*p< 0.1, **p< 0.05, ***p< 0.01

### 4.4.2 A gendered and regional perspective of primary school enrolment status

In the above section, we present the results of the determinants of primary school enrolment status, however, such analysis masks several things which a gendered and regional perspective unearths and is presented in this section. From this analysis several interesting findings emerge. First, we observe that despite age being statistically significant at 1% across both gender and regional perspectives we observe

the effect of age on school enrolment is higher among the boys compared to the girls. In addition, we find that the impact was highly significant in urban areas as compared to rural areas. Similarly, we find that a mother's education level was found to have a higher likelihood of child enrolment for males at 25.3% as compared to females at 23.0% ceteris paribus. A father's education level, on the other hand, was found to have a higher likelihood of child enrolment for males at 13.4% as compared to females at 13.6% ceteris paribus.

From the regional perspective, parents' education level increased the probability of primary school enrolment for the rural dwellers more than for the urban dwellers. Both the paternal and maternal education positively affects the propensity of enrolment. In terms of age, unlike the mother's age, father's age was positively correlated with a child's enrolment. This implies that unlike younger parents, older parents invest more their children's education by enrolling them in school and this can be attributed to financial savings set aside for education from their earnings over the years.

Further, we find that in the rural and urban areas, distance negatively impacts on enrolment an indication that distance to school affects both urban and rural residents in the same manner though not statistically significant. In terms of household size, we also observe the existence of differential effects. First, among the boys, a larger household is associated with higher enrolment albeit insignificant at all levels. However, in the girl's sample we find that higher household size is positively and significantly associated with higher enrolment rate a trend which is also observed among those residing in the rural areas. On the contrary, we observe a negative relationship between household size and school enrolment among urban residents which is intuitive.

**Table 4.6. A gendered and regional analysis of the correlates of primary school enrolment**

| | Marginal Effects from Probit estimation | | | |
|---|---|---|---|---|
| | (1) Male | (2) Female | (3) Rural | (4) Urban |
| **Individual Characteristics** | | | | |
| Age of the Child (in years) | 0.055*** | 0.045*** | 0.049*** | 0.052*** |
| | (0.00) | (0.00) | (0.00) | (0.01) |
| Gender (=1 if male, 0 otherwise) | | | 0.087*** | 0.039 |
| | | | (0.02) | (0.02) |
| **Household Characteristics** | | | | |
| Household Size | 0.004 | 0.008* | 0.012*** | -0.004 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Per capita household expenditure | -0.021 | -0.004 | -0.009 | -0.017 |
| | (0.01) | (0.01) | (0.01) | (0.02) |
| Education of the mother | 0.253*** | 0.230*** | 0.272*** | 0.155*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| Education of the father | 0.134*** | 0.136*** | 0.133*** | 0.130*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| Land ownership (=1 if owns land, 0 otherwise) | 0.008 | 0.013 | 0.034 | -0.033 |
| | (0.03) | (0.03) | (0.03) | (0.03) |
| Age of the father | -0.002** | -0.001* | -0.002** | -0.002* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Age of the mother | 0.001 | -0.000 | -0.001 | 0.002* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| **Community Characteristics** | | | | |
| Time to the Nearest Primary School | 0.006 | -0.019 | -0.005 | -0.012 |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Residence (=1 if urban, 0 otherwise) | 0.116*** | 0.114*** | | |
| | (0.03) | (0.03) | | |
| Time taken to the nearest source of water | -0.000 | 0.001** | 0.000 | 0.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| State1 | -0.004 | -0.136*** | -0.051* | -0.150*** |
| | (0.03) | (0.03) | (0.02) | (0.04) |
| State2 | -0.123* | -0.033 | -0.013 | -0.114* |
| | (0.06) | (0.05) | (0.10) | (0.04) |
| State3 | -0.008 | -0.163*** | -0.087*** | -0.097* |
| | (0.03) | (0.03) | (0.02) | (0.04) |
| State4 | 0.169*** | 0.169*** | 0.203*** | 0.072 |
| | (0.04) | (0.04) | (0.03) | (0.05) |
| State5 | 0.074 | 0.049 | -0.004 | 0.050 |
| | (0.07) | (0.06) | (0.08) | (0.05) |
| Constant | 1603 | 1698 | 2362 | 939 |

$t$ statistics in parentheses
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

# CHAPTER FIVE
## SUMMARY, CONCLUSION, AND POLICY RECOMMENDATIONS

### 5.1 Summary of findings

In this paper, we examine the determinants of primary school enrolment in South-Sudan using the South Sudan High-Frequency Survey (SSHFS) which is a nationally representative survey conducted between August 2012 and September 2014 by the World Bank and National Bureau of Statistics of South Sudan and interviewed 3550 households using a stratified two-stage sampling approach.

The estimation of the determinants of primary school enrolment is undertaken by adopting a baseline regression estimates obtained from estimating a linear probability model (and the main regression results which are reported are the estimates of the probit estimator. In the second step, we undertake a gender and regional analysis of the determinants of primary school enrolment. In terms of child characteristics, the results offer interesting insights. First, we find that holding other factors constant, being male increased the likelihood of being enrolled than females which implies that boys were more advantaged compared to girls. Second, we find that an additional age of the child increases the propensity of enrolment. Third, we observe that despite age being statistically significant across both gender and regional analysis we observe that the effect of age on school enrolment is higher among the boys compared to the girls with the impact being highly significant among children from urban households than from rural households.

At the household level, we find that household size, higher paternal and maternal education, as well as land ownership, are associated with a higher propensity of a child being enrolled in school. Other household-level factors associated with a child's enrolment in school are the age of the mother and father. On the contrary, we find that higher household expenditure is associated with lower primary enrolment. This is because any extra income generated by a given household is absorbed by other

household bills such as food, health, water and electricity. There is very little income left behind that could be possibly channelled towards educational expenses which entail not only tuition fees but also transportation and upkeep costs for the child while in school. At the community level, children from urban households have a higher probability of being enrolled in school compared to children from rural households which could be attributed to the proximity to schooling facilities. Similarly, better infrastructural facilities such as good roads in urban areas tend to increase primary school enrolment among children. In addition, we also find evidence that the farther the school is, the more the time needed by the child to cover to reach the learning facility hence the lower the chances of the child enrolling in school.

## 5.2    Conclusions and recommendations

Based on the findings of the study several conclusions and policy implications arise. First, we conclude that individual characteristics play an integral role in explaining a child's enrolment in school. First, we observe that being male increased the likelihood of being enrolled than females which implies that boys were more advantaged compared to girls. Second, we find that an additional age of the child increases the propensity of enrolment. Third, the enrolment choices at the gendered and regional analysis reveals preferences for education among boys is higher than among girls. This gendered differential is in and of itself should be of concern to policymakers. First, it is imperative that education policies should be put in place to ensure that girls are equally given an opportunity to school just like the boys are. This measure will ensure that the gender gap in schooling is addressed to the benefit of society.

In terms of household characteristics, we observe that they also play an instrumental role with education and age of the mother and father influencing a child's schooling enrolment. These findings have important policy implications. First, efforts to enhance school enrolment will eventually yield efforts in later years when the school going children are older and have families. In a sense, the pursuit of higher education

should be a means to ensuring the future generations of the children are also able to attain higher education. We also observe that household expenditure is associated with a lower probability of school enrolment as the expenditure is skewed towards health and food-related items. This, therefore, calls for the subsidization of education expenses which will ultimately give incentive to parents to enrol their children as the cost of enrolling a child will have been cutback.

In terms of community characteristics, we observe that two factors are key in influencing a child's enrolment status. First, households residing in an urban area is more likely to have their children enrol in school and this is attributable to the fact that in urban areas there is proximity to schooling facilities as compared to rural areas. In order to boost enrolment in the rural areas, there is need to set-up more schools and this will also reduce the time take to school and therefore surmount the challenges of having to spend too much time getting to school which as our findings show have a detrimental effect of lowering the probability of being enrolled in school.

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# Appendix

## Appendix 1:   Map of South-Sudan
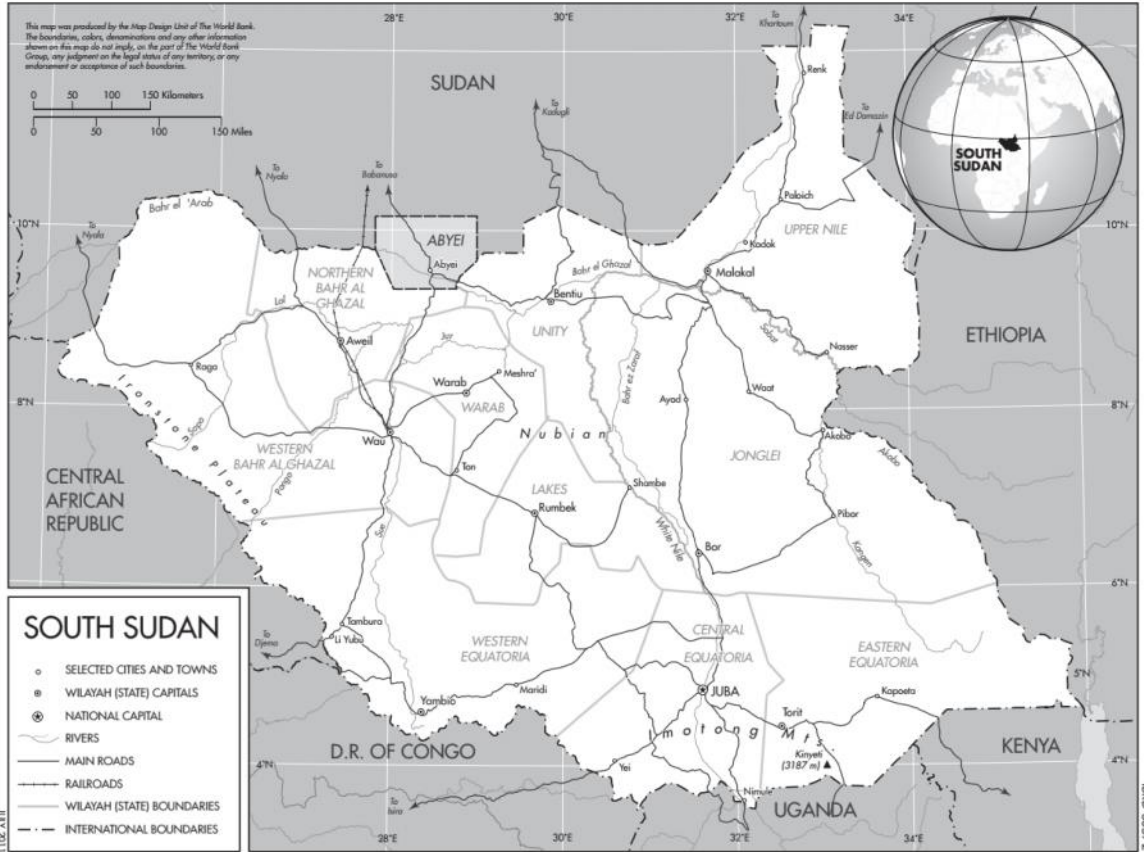


*Source:* World Bank

**Appendix II: A gendered & regional perspective on Primary School Enrolment**

| | (3) Probit Male | (4) Probit Female | (5) Probit Rural | (6) Probit Urban |
|---|---|---|---|---|
| Household Size | 0.013 | 0.030** | 0.038*** | -0.018 |
| | (1.01) | (2.14) | (3.32) | (-1.07) |
| Per capita household expenditure | -0.073 | -0.013 | -0.028 | -0.075 |
| | (-1.50) | (-0.29) | (-0.74) | (-1.07) |
| Education of the mother | 0.887*** | 0.806*** | 0.875*** | 0.693*** |
| | (11.59) | (11.16) | (14.58) | (6.13) |
| Education of the father | 0.469*** | 0.476*** | 0.428*** | 0.579*** |
| | (5.97) | (6.29) | (6.70) | (5.31) |
| Gender (=1 if male, 0 otherwise) | | | 0.281*** | 0.173 |
| | | | (4.92) | (1.64) |
| Time to the Nearest Primary School | 0.023 | -0.067* | -0.017 | -0.054 |
| | (0.48) | (-1.65) | (-0.44) | (-1.12) |
| Age of the Child (in years) | 0.191*** | 0.156*** | 0.156*** | 0.233*** |
| | (11.35) | (9.84) | (11.98) | (8.78) |
| Land ownership (=1 if owns land, 0 otherwise) | 0.028 | 0.045 | 0.110 | -0.145 |
| | (0.29) | (0.40) | (1.25) | (-1.02) |
| Age of the father | -0.006*** | -0.004** | -0.005*** | -0.008** |
| | (-3.00) | (-2.17) | (-3.22) | (-2.42) |
| Age of the mother | 0.003 | -0.002 | -0.003 | 0.010** |
| | (0.84) | (-0.51) | (-1.08) | (2.07) |
| Residence (=1 if urban, 0 otherwise) | 0.405*** | 0.398*** | | |
| | (4.45) | (4.34) | | |
| Time taken to the nearest source of water | -0.000 | 0.002*** | 0.001 | 0.001 |
| | (-0.08) | (2.60) | (1.20) | (1.06) |
| State1 | -0.014 | -0.475*** | -0.166** | -0.667*** |
| | (-0.13) | (-4.75) | (-2.08) | (-3.59) |
| State2 | -0.432** | -0.115 | -0.043 | -0.507** |
| | (-2.18) | (-0.62) | (-0.13) | (-2.51) |
| State3 | -0.028 | -0.572*** | -0.279*** | -0.432** |
| | (-0.28) | (-6.04) | (-3.71) | (-2.35) |
| State4 | 0.592*** | 0.591*** | 0.652*** | 0.321 |
| | (4.51) | (4.37) | (6.02) | (1.46) |
| State5 | 0.261 | 0.172 | -0.013 | 0.224 |
| | (1.12) | (0.85) | (-0.05) | (0.94) |
| Constant | -2.212*** | -1.978*** | -2.204*** | -1.732*** |
| | (-11.08) | (-10.48) | (-13.94) | (-5.53) |
| *N* | 1603 | 1698 | 2362 | 939 |