UNIVERSITY OF CAPE COAST

PARENTS' EXPECTATIONS AND INVESTMENT IN CHILD EDUCATION: EVIDENCE FROM RURAL GHANA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:…… Date:…….

Name: Ferdinand Ahiakpor

Supervisors' Declaration

We hereby declare that the preparation of this thesis were supervised and presented in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

It was until the early 1990's that economists began to place greater emphasis on the role of human capital development as the basic rock for development. Using a multi-stage sampling technique, the researcher interviewed a sample of 868 households in rural Ghana. The study adopted unitary model of intra household decision model to examine parents' expectation and investment in children's education in rural Ghana. The study revealed that the probability that children getting the desired jobs in the future, the benefits of the education to the parents, the average cost of education, the discount rate of the parents, the number of children in the household and the income level of the heads of households were the major factors that influenced the proportion of children enrolled in school.

On the issue of resource allocation in the household, expected remittance from children, job market discrimination and a number of parent-specific socioeconomic had a major role to play on educational resources allocation. The study further revealed that there was gender bias when it came to resource allocation. The study recommends that government should create more jobs to employ graduates and also eliminate liquidity constraint. The study further recommends the enforcement of the labour law against discrimination. Finally, educational cost like Parent Teacher Association (PTA) dues, extra classes' fees should be stopped in schools.

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DEDICATION

To my family

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CG	Capitation Grant
CME	Combined Marginal Effects
CPP	Convention People's Party
fCUBE	Free Compulsory Universal Basic Education
FUPE	Free Universal Primary Education
GLS	Generalized Least Squares
FUP	Free Uniform Programme
FSUP	Free School Uniform Programme
GDP	Gross Domestic Product
GoG	Government of Ghana
GLSS	Ghana Living Standard Survey
GPRS	Growth and Poverty Reduction Strategy
GSS	Ghana Statistical Service
HIV	Human Immunodeficiency Virus
IV	Instrumental Variables
LDCs	Least Developing Countries
MC	Marginal Cost
MB	Marginal Benefit
MDG	Millenimium Development Goal
MENA	Middle East and North Africa
NDC	National Democratic Congress

NPP	National Patriotic Party
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PNDC	Provisional National Defence Council
PTA	Parent Teacher Association
2SLS	Second Stage Least Square
SFP	School Feeding Programme
SSA	Sub-Saharan Africa
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNDP	United Nations Development Programme
WB	World Bank
WLS	Weighted Least Squares

CHAPTER ONE

INTRODUCTION

Background to the study

The importance of education and human capital formation in fostering economic growth and development of less developed countries cannot be overemphasized. It has been shown that education and skills acquisition has positive effects on economic growth and development (Dickson, Sawhil & Tebbs, 2006; Schultz, 1961). Therefore, investments in children's education is the main avenue for human resource development and capital accumulation required for building long- term productive capacity of a country. It is, therefore, essential that a country provide perfect environment for unfettered access to knowledge and skills that would increase the future productivity of children. Education, in particular (formal and informal) is considered as the main means through which children can achieve high productivity levels. Agyeman, D., Baku, J. and Gbadamosi (2000) note that 'in this modern time, education is accepted as the process by which individuals acquire knowledge, skills, and attitudes which enable them to develop their faculties in full''. Generally, at the micro-level, an individual's educational attainment is one of the most important determinants of his or her life chances in terms of access to employment, income, good health, housing, information, general welfare and quality of life (Heckman & Masterov 2004; DeLong, Golden & Katz, 2003; Card & Lemieux, 2001; Barro 1991). Grilliches (1997) and Barro (1991) notes that, the individuals who receive formal education gain a wide range of personal, financial, and other lifelong benefits.

Similarly, taxpayers and society as a whole derive direct and indirect benefits when citizens have attained quality education, skill and training. A UNESCO review by Agyeman et al. (2000) notes that benefits associated with formal education are so great that even when current consumption components are excluded, the rates of return on education are far higher than return on investment in physical capital.

Tilak (2005), Chakraborty & Mausumi (2005), Dahlin (2005) and Barro (2001), on their studies on human capital development, have shown that the productivity of a country's labour force depends, among other things, on the level of formal education. Formal education and training provide the skills needed for the effectiveness and efficiency of the labour force (Behrman, 2010; Tamura, 2002). The highly positive nature of the relationship between productivity and the level of education suggests that educated people might be more productive than the uneducated (Jones, 2001; Barro & Lee, 2000). Jones (2001) goes on to report that the more skillful and productive an individual becomes, she/he is likely to increase the output of goods and services produced. This may contribute greatly to the economic development of the country. Furthermore, Michaelowa (2000) also noted that formal education has a positive link as with overall economic development. In sum, education has been perceived to be very important in ensuring higher productivity, growth and economic development. This is evidenced in the work of Lucas (1998), who demonstrated that investing in children's education is crucial for development of an economy.

In the year of Ghana's independence, thus in 1957, it was estimated that only 3.6 percent of the total population of the country's had formal education (Graham, 1971; UNESCO, 1958) as compared to Japan whose population with educated people per population was 91 percent which that had also adopted the free educational policy. In order to drive the development agenda of Ghana, the government looked at the proportion of the population with formal education. Moreover, the Ghana Statistical Service (1961) Population and Housing Census Report showed a great disparity between school enrolment in rural and urban areas of Ghana. The difference between rural and urban school enrolment makes it difficult or impossible for the country to achieve full school enrolment at the primary level. In an attempt to plug the gap between rural and urban school enrolment and achieve full school enrolment, various policies have been adopted, all aimed at encouraging school enrolment. For example, The 1961 Act (Act 87) initiated by Dr. Kwame Nkrumah, the first president of Ghana was aimed at achieving Free Universal Primary Education (FUPE). The Act also made formal education compulsory. The Vision 2020 Document (a government projected plan) also made a case for free Compulsory and Universal Basic Education (fCUBE) in the country. Other government – backed schemes such as the Capitation Grant (CG), the School Feeding Programme (SFG) and the Free School Uniform Programme (FSUP), launched from the 1980s were all geared towards making formal education accessible to all.

Despite all the policies adopted by the various governments namely, Convention People Party (CPP), Provisional National Defence Council (PNDC),

National Democratic Congress (NDC) and the New Patriotic Party (NPP) to achieve full school enrolment rate, the enrolment ratio continues to be low among children in rural Ghana in comparison to those in the urban Ghana. According to the Ghana Statistical Service (2008) Living Standard Survey report, the current school enrolment is about 86.3 percent for Ghana but just about 31 percent in rural Ghana. Even though there have been improvement in the percentage, it leaves much to be desired when it is compared to statistics from advanced countries and urban Ghana where enrolment is hundred percent or near hundred percent. In addition to the disparities observed in school enrolment in Ghana, evidence from the Ghana Statistical Service (2008) Living Standard Survey report again reveals that more male children are enroled in schools than their female counterparts. Graham (1971) reports school enrolment disparity between male and female to a ratio of 1:3 in favour of male children. The disparity in school enrolment based on gender is also reported by the World Bank (2001).

In the light of the widely documented disparities in the levels of formal education between high and low income economies, it is presupposed that observed divergent decisions on the use of a child's time are largely the result of the incongruent economic settings underlying economic choices in both types of economy. Low-income settings are characterised by a large degree of risk and uncertainty in everyday life (Broll & Wahl, 1998). Therefore, it is reasonable to expect income risk to play an important role in shaping household choices and resource allocation decision in a low income setting. The household's ability to deal with such income risks and to ensure smooth consumption across time is

constrained by thin insurance markets and credit markets and weak social security systems. These distinguishing features of low income settings create the need for households to adopt alternative ways of coping with uncertainties.

As a result of the uncertainty faced by parents, the optimal investment in human capital of any family member calls for a consideration of not only the human and financial capacities in the family but also the prospective utilization of capital accumulated. Consequently, the expectations regarding future family and labour market activities of an individual wield a great influence on the levels and forms of human capital investment. In other words, family investments in children's education and utilization of the child's time are directly linked. While the current distribution of human capital influences the current allocation of time within the family, the prospective allocation of time influences current investments in human capital. Coping with such rigid income exposures often involve intra-household resource allocations which bear characteristics similar to risk-return trade-off inherent in asset allocation decisions in portfolio management (see Markowitz, 1952a, 1952b)., but much more complex investment in children's human capital involves consideration of not only the human and financial capacities in the family but also the prospective benefit of the capital which accumulates in the child. This implies that the family will invest in formal education, as long as the discounted future returns exceed the discounted direct and indirect costs of such an investment.

However, investment decision is more complex when it comes to formal school education of children in developing countries. The human capital

investment decision for each child is made by the head of the family. The complexity arises from the fact that parents bear the costs of providing both formal and informal forms of education of their children, whereas the individual child receives the future benefits. The parents then decide the number of children to be kept at home and the number to be sent to school. Another dimension of the argument is that if parents decide to enrol a number of their children in school, there is normally gender bias regarding educational expenditure, as commonly found in Africa. This is because parents' decision to invest in human capital is motivated by returns to education and future transfers, which are both affected by perceived gender earning differentials. According to Tansel (1997), girls aged between 12 and 16 in Cote d'lvoire and Ghana receive on average 3.31 years of schooling, while their male counterparts receive 4.75 years. Duraisamy (2002) and Beal (2001) show that parental preferences play an important role in children's schooling decisions. For example, parents tend to invest more resources in their biological children and also in children they consider to be intelligent than in those that are not their biological children, or children who are regarded as not intelligent. This decision of parents as to how to invest in their children's education is greatly influenced by their future expectations. In the African context, such human capital investment decisions are typically made by the head of the family (often the male) as posited by neoclassical household behaviour model, also known as the unitary model (Samuelson, 1956).

Also, according to Raut (1990), the underlying assumption is that in the absence of well developed markets, parents depend on their children for old age

support. Thus children not only provide utility to parents analogous to the latter current consumption of goods but importantly serve as channels of investment for the provision of their old age consumption (World Bank, 1984; Gillaspy & Nugent 1983; Caldwell, 1982). This is to say that parents view the number of children and allocation of income towards their children's education as an investment decisions.

In order to unveil the complexity in decision taking by parents concerning investment in their children's education, uncertainty at old age and about the future returns from children based on their gender, the present study includes uncertainty in a unitary model and also captures the specific characteristics that pertain in rural Ghana. Notwithstanding the unitary model's failure to disaggregate intra-households preferences, this model can provide better analytical insight into decisions to invest in children's education in Ghana and wider Sub-Saharan African context because decisions on education, land tenure and crop production are taken, monitored or sanctioned by the head of the household, often a male.

Statement of the problem

The importance of education and human capital development in fostering economic growth and development of less developed countries cannot be overemphasized. It has been shown that education and skill acquisition have positive effects on economic growth and development (Dickson et al, 2006; Barro, 2001; Schultz, 1961). At micro – level, an individual's educational

attainment is one of the most important determinants of his or her life chances in terms of access to employment, income, health status, housing, information, general welfare in terms of quality of life (Heckman & Masterov, 2004; DeLong et al., 2003; Card & Lemieux, 2001). Grilliches (1997) and Barro (1991) note that the individuals who receive formal education gain a wide range of personal, financial and other lifelong benefits. Similarly, taxpayers and society as a whole derive direct and indirect benefits when citizens have attained quality education, skill and training.

In the late 1970's, when the economy of Ghana experienced great regression, government revenue fell drastically, resulting in a huge fall in investment in education by the government of Ghana. The situation resulted in a drastic fall in children's school enrolment and during this period the country's productivity also fell, indicating the positive link between education and productivity (Meng, 2009). Also, on the issue of investment in child education, the World Bank (2002) shows that there is regional disparity in primary schools' enrolment in Ghana. The report indicated school enrolment in the rural Ghana was about 31 percent while that of urban area was about 70 percent. This pattern of regional disparity is also reported in the Ghana Living Standard Survey report (2008). Despite all the various measures put in place to improve school enrolment in both rural and urban areas of Ghana (e.g. Capitation grant, free Compulsory Universal Basic Education (fCUBE), and School Feeding Programme (SFP)), Ghana has not yet attained the 100 percent school enrolment target.

In addition to the regional disparity, the Ghana Living Standard Survey report (2008) also showed disparity in school enrolment based on gender. The gender disparity in school enrolment is also supported by Tansel (1997). One major characteristic of Ghana with regard to education is that each head of household decides on the number of children to keep at home and the number to educate formally. Even with the number to educate, the decision is based on gender. In numerous studies, boys are found to have better school advantage compared to their female counterparts (Nkamleu & Kielland, 2006; Davies & Zhang, 1995; Behrman et al., 1982) or to have better health outcomes (Gupta & Chakraborty, 2004; Rosenzweig & Wolpin, 1988; Senauer et al., 1988; Rosenzweig & Schultz, 1982). The uneven school enrolment across region and gender which is in conformity with various studies has been confirmed in the World Bank (2002) report. DeTray (1988) observes that demand for girls' schooling is more income elastic than for boys and also Behrman and Knowles (1999) consider education of girls as a luxury but necessity for boys. Also, Song (2001), on the study of intra household resource allocation finds that greater wife bargaining power in the household changes expenditure patterns in favour of health care and girl child education, but this does not reduce the pro-boy discrimination in these expenditures. Further, Yueh (2001) in his study on parental investment in children concluded that labour market discrimination will cause investment to differ for sons and daughters, given the perceived gender differential earnings, parents will invest more in the human capital of boys. To find a solution to this complexity in parents' decision making with regard to

investment in children education under uncertainty of parents in rural Ghana, the following questions need to be asked:

1. What are the expectations of parents in investing in their children's education?
2. What factors determine parents' decision-making regarding children's schooling?
3. What accounts for the inequality in resource allocation between boys and girls in Ghanaian households?
4. Can the need for ex-ante risk diversification be so strong that it will result in some children not being sent to school in order to diversify the human capital portfolio of the household? Thus, does the need for risk diversification due to uncertainty about future returns have any influence on the parents' decision to send their children to school?

Haddad et al. (1997), in studying investment in child education, tested the extent to which parents would forgo consumption to spend on children's education. Again, Becker (1993) studied parental decision to invest in children's human capital and the returns that would accrue not only to the children, but also the portion of the returns that would generate transfers to parents in the future. In addition, he used the intra household resource allocation approach to investigate the present costs and future benefits of these investments in children. In addition, various scholars (Yueh, 2001; Behrman & Knowles, 1999; Song, 1999; Alderman & Gertler, 1997; Behrman, 1997; Becker, 1981) have also studied parents'

investment in their children's human capital, using various intra household and inter generational models.

However, despite the vast work done on parents' investment in children's education, none of them incorporates parental uncertainty about the future income from children and sibling dependency in the human capital investment decision. The aim of this research is to model the intra household decision model of households in rural Ghana and incorporate uncertainty of the parents. This would provide an empirical analysis of investment in human capital for parents in rural Ghana under conditions of uncertainty of the future with respect to their income and consumption.

Objectives of the study

The main objective of the present study is to examine parents' expectations and investment in children's education. In specific terms, the objectives of the research are to:

i. determine the factors that influence rural parents' decision regarding enroling children in school;

ii. determine the factors that influence parents' decision in resource allocation between boys and girls in the household under uncertainty; and

iii. examine whether there is gender bias in spending on children's education in rural households in Ghana.

Hypotheses

The model used in the investigation of portfolio diversification, within the household, was derived from the solution of an inter-temporal utility maximization problem in an overlapping generations setting. The hypotheses tested in this study were as follows:

i. The average cost of sending a child to school does not influence parents' decision, regarding the number of children sent to school;
ii. The number of children in a household does not have any influence on the number of children sent to school;
iii. The benefit of education does not influence the number of children sent to school;
iv. The probability that the child will get the desired job after school does not influence parents in their decision to invest in the child's education;
v. The income of the parents does not influence the number of children enroled in school;
vi. The location of the heads of the households does not influence the number of children enroled in school;
vii. The discount rate of the heads of the households is inversely related with the number of children enroled in school;
viii. There is no gender bias in educational spending on children in rural Ghana;
ix. Uncertainty about the future does not influence parents in resource allocation between boys and girls in the household

Justification of the study

Various governments in Ghana have adopted various policies to achieve full school enrolment, at least at the basic level. Many of these policies such as the Capitation Grant (CG), Free Uniform Programme (FUP), School Feeding Programme, Free Compulsory Basic Education and the provision of new school books, supply of adequate teachers, supply of teaching-learning materials can all be considered as a supply-side policy of achieving the target of full school enrolment. In Ghana, the demand side has not been given as much emphasis as the supply side. Government's provision of school facilities does not necessarily lead to the use of the facilities. The decision to enrol a child at school, and resources for children's education, is still made by the household and this involves high opportunity costs to rural households. Typically, the household's decision to enrol a child at school involves forgoing immediate income (or returns) from the use of the child's time. This may involve directly supplying labour in the family enterprise (agriculture, mining, fishing, petty trading etc), childcare for younger siblings, undertaking household chores or paid work to supplement household income. Moreover, enroling a child in school involves direct costs in the form of fees, school uniform, books and related costs which can impose financial burden on rural households. Therefore, to succeed in achieving full school enrolment, it is important that we understand parental decision-making process, as it becomes very critical in formulating government policies.

One of the major contributions of this study is to improve the understanding of parental decision-making regarding schooling in rural Ghana. In

addition, this study will contribute to the existing literature by focusing explicitly on expectations of parents for investing in human capital of their children, and by modeling the human capital investment decision for all children in the household, rather than for the individual child, using a simple human capital portfolio model. Also, it will serve as a reference point for analysing investment in children's in Ghana. Very few studies have investigated parental decision-making in relation to investment in the education of children generally. Apart from Aglobitse (2006) and Glick and Sahn (2000) whose studies concern parental decision, there have not been any studies investigating uncertainty into the intra household model in rural Ghana. Consequently, one of the key issues that this work seeks to address is to incorporate uncertainty into the intra household model for rural Ghana and also provide an empirical work on parents' expectations and investment in their children's education.

Organisation of the study

The work is organised into seven chapters. Chapter One covers the introduction to the study and consists of the background to the study, statement of the problem, research objectives, hypotheses, significance of the study and finally, organization of the study. Chapter Two reviews relevant literature and mainly consists of theoretical and empirical literature on expectation and investment decision making, importance of education and investment in education and gender. Chapter Three looks at the research methodology. Chapter Four presents the demographic characteristics of the respondents. Chapters Five and Six deal

with the empirical analysis and discussion of the results of the study. The final chapter, Chapter Seven, summarizes the whole work along with conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter review both theoretical and empirical literature. Human capital theory, conjugal power theory, rational and adaptive expectation theory and brief history of education and educational policies in Ghana were some of the relevant literature review under the theoretical literature. In the area of empirical literature, literature was review on expectations and educational investment, education and productivity, return to education, determinants of school enrolment, gender and returns to schooling, gender disparity in education and productivity and finally on some related interventions in Ghana.

Theoretical Literature Review

Human capital theory

The origin of human capital goes back to the emergence of classical economics in 1776, and thereafter developed a scientific theory (Fitzimons, 1999). After the manifestation of that concept as a theory, Schultz (1961) recognized the human capital as one of important factors for a national economic growth in the modern economy. With the emergence and development of human capital as an academic field, some researchers expensively attempted to clarify how the human capital could contribute to socio-political development and freedom (Grubb & Marvin, 2004; Sen, 1999; Alexander, 1996).

The concept of human capital can be variously categorized by each perspective of academic fields. The first viewpoint is based on the individual aspects. Schultz (1961) recognized the human capital as 'something akin to property' against the concept of labor force in the classical perspective, and conceptualized 'the productive capacity of human beings in now vastly larger than all other forms of wealth taken together'. Most of researchers have accepted that his thought viewing the capacity of human being is knowledge and skills embedded in an individual (Beach, 2009). Similar to his thought, a few researchers show that the human capital can be closely linked to knowledge, skills, education, and abilities (Youndt, M., Subramaniam, M. and Snell, S., 2004; Garavan, T. N., Morley, M., Gunnigle, P., & Collins, P., 2001). Rastogi (2002) conceptualizes the human capital as 'knowledge, competency, attitude and behavior embedded in an individual'.

There is the second viewpoint on human capital itself and the accumulation process of it. This perspective stresses on knowledge and skills obtained throughout educational activities such as compulsory education, postsecondary education, and vocational education (Alan at al., 2008). Despite the extension of that concept, this perspective neglects that human being would acquire knowledge and skills throughout his/her experience.

The third is closely linked to the production-oriented perspective of capital. Romer (1990) refers to the human capital as 'a fundamental source of economic productivity'. More recently, Frank & Bernanke (2007) define that human capital is 'an amalgam of factors such as education, experience, training,

intelligence, energy, work habit, trustworthiness, and initiative that affect the value of a workers' marginal product'. Considering the production-oriented perspective, the human capital is 'the stock of skills and knowledge embodied in the ability to perform labor so as to produce economic value' (Sheffrin, 2003). Furthermore, some researchers define that human capital is 'the knowledge, skills, competencies and attribute in individuals that facilitate the creation of personnel, social and economic well-being' with the social perspective (Rodriguez & Loomis, 2007).

Consequently, human capital simultaneously include both of the instrumental concept to produce certain value and the 'endogenous' meaning to self-generate it. Human capital has the following features: it is accumulated slowly, it is an investment, it yields economic return and that is can depreciate in value due to new knowledge or technical progress.

In order to dependently/independently create these values, there is no doubt that learning through education and training can be an important in terms of defining the concept of human capital. Considering that experience can be included as a category of knowledge, the human capital is a synonym of knowledge embedded in individual.

The theory of conjugal power

The connection between conjugal power relations and existing resources was first explicated in Blood and Wolfe's (1960) Resource Theory. Derived itself from Thibaut and Kelley's (1959) Social Exchange Theory (later developed by Blau 1964), Resource Theory claims that marital relations are based on an

exchange in which each spouse contributes equal resources toward satisfaction of the other's needs. Notwithstanding cross-cultural differences in the extent of flexibility regarding the obligations of marital partners toward one another, it is generally believed that marriage involves mutual satisfaction of needs.

However, dependency may ensue when one partner provides more vital resources which cannot be contributed by anyone else. This, in turn, puts the partner with a resource advantage in a position of power. It is thus assumed that the greater the husband's perceived resource advantage over his wife, the greater his perceived power advantage in marital relations.

In addition to the impact of resources, conjugal power relations are also said to be influenced by cultural context, i.e., the attitudes toward gender roles prevailing in the couple's social environment (Rodman, 1972, 1967). According to this approach, which has received partial empirical support in a number of countries (Cooney et al., 1982; Katz 1980; Cromwell et al., 1973 and Lupri 1969),the wife's resources have limited impact on conjugal power relations when conservative attitudes toward gender roles prevail; even if she possesses substantial resources, she usually accepts the traditional norms regarding marital relations.

In contrast, when egalitarian attitudes toward gender roles are dominant, there is a freer exchange of resources that offer decision-making power. Gender attitudes affect not only perceptions of resources but also marital dynamics in general. Thus, it is expected that the more traditional the husband's attitudes toward gender roles, the more likely he is to report an advantage in conjugal

power relations. According to Lewis and Cooper (1988), beliefs about gender relationship are interwoven in the ideology of the family and culturally defined. In Israeli society, which has absorbed a constant flow of immigrants, there is a mixture of normative trends. It is commonly believed that Easterners (Israelis of Afro-Asian origin) hold more conservative attitudes regarding gender roles than Westerners (of European or American origin).

It is therefore also hypothesized that background variables will affect gender role attitudes. This pertains not only to ethnicity, but also to religiosity: religious people are expected to have more conservative attitudes toward gender roles than their secular counterparts (Rodman, 1972, 1967). It is further assumed that the higher the individual's level of education and his/her occupational status, the more liberal his/her attitudes will be (Coverman, 1983; Murillo, 1971; Scanzoni, 1975).

Recent comprehensive studies of conjugal power relations suggest that expressive variables, such as emotional commitment to the spouse, also play a role (Blumberg & Coleman, 1989; Kranichfeld, 1987; McDonald, 1980). Since the family is a primary social unit founded on emotions, intimacy and expressiveness, emotional commitment is considered a key variable shaping marital ties (Strube & Barbour, 1983; Mudd & Toulin, 1982).

In the current modern societies, negotiations between the sexes in households are complicated by a number of factors. Both sexes are likely to be inexperienced in managing the vulnerability and give and take of marriage. But they aren't just uncertain about the procedures of the process; they also are likely

to have an imperfect understanding of the value of what they are trading. This seems especially likely to be a problem for a young woman, both because of dilemmas posed as a woman and the discrepancy between the developmental immaturity, and her frequent perception of her own lower status. In general, as pointed out by Symons (1979), women control the ultimate natural resource in the household- sexual resource.

Despite the power that this control would seem to grant to women, many of them have difficulty wielding it effectively in their negotiations. If a woman comes from a family where women have little power or sons are valued more, she may perceive herself to have relatively low status. Even if she is attractive and intelligent, she may strike a poor bargain in household decision. This is because psychopathology may often play a role here, as neurosis or very low self-esteem causes inhibition and failure to develop or utilize personal strengths interpersonally (Johnson 1976).

Buss (1989, 1987) has collected a variety of evidence to support what has been the pretheoretical observation of many; namely, that wealth and high status will have a greater effect on male influence in the household. Consistent with this is Elder's (1969) data that physical attractiveness and wealth was most predictive of a higher men influence in the home. This means that in a household decision, the decision is mostly an exchange between the statuses a woman possesses by virtue of her socioeconomic. In such negotiations, though, the man is likely to be somewhat older; giving him something of an advantage in experience and economic control a woman with high socio economic status would exert more

influence on household decision especially with regard to children's school enrolment.

Even if both individuals are making significant contributions, those of them other tend to be more directly bestowed upon the child and are likely to involve the satisfaction of basic needs (food preparation, personal hygiene, clothing, etc.) that are unavoidable and therefore less under her discretionary control. Men tend to contribute indirectly by working outside the home for money. In this way they have greater discretionary control over their actual contribution to the offspring. That men tend to control the economic resources of the family not only gives them more power within that unit but also gives them the opportunity to invest elsewhere. Women have quite understandably tried to gain greater control over economic resources by also working outside the home. This has permitted them to a greater degree of independence and arrange of opportunities. However, as many mothers working outside the home have discovered, this also increases further the size of their investment. Since male contributions at home may increase little if at all when the mother takes a job (Blumstein and Schwartz 1983) the discrepancy between their contributions may only become greater, adding to more of involvement in decision making.

To end, the resource theory of conjugal power conclude on that the degree to which a partner can influence decisions in a household depends on the extend the value of resources they bring into the marriage.

Rational expectations revolution

Expectation formation is a central issue in macroeconomics. Formally, the adoption of various adhoc assumptions about the process of expectation formation have allowed the development of simple macroeconomic models whose dynamic properties might be analysed but this has been difficult as the assumptions are arbitrary. Recent work on the hypothesis of rational expectation has commanded considerable attention because it seems to rely on good optimizing principle: individuals should not make systematic mistakes in forescasting the future. It is not appealing to assume that individuals make predictable errors yet take no action to revise their rule for forming expectations, but adhoc expectation assumptions typically possess this property; only under rational expectation is the contradiction avoided.

Throughout the last decade, rational expectation has been the major theme in economics as it has been viewed to be a major breakthrough in methodology. In addition, the hypothesis has a wider significance in analyzing economic issues. However, these discoveries do not go without criticism and these criticisms fall into two groups: those who reject rational expectation as a plausible model of actual behavior, and those who find the hypothesis attractive but nevertheless are troubled by the results it generates when applied within the market clearing natural rate models. Critics within the second group gradually realize that it is the structure of the underlying model, in particular the assumption of market clearing under flexible prices, to which they really wish to object

The impact of the hypothesis of rational expectations has not been confined to theoretical macroeconomics. Empirical econometricians have constructed a model of national economies to be used both for forecasting and for policy evaluation, in which the simulation of hypothetical policies allow a better understanding of the likely consequencies of adopting the policy. The hypothesis of rational expectations not only exposes a problem which had previously gone unnoticed, but also provides a framework in which to predict the probable revision of expectation when a new policy is adopted.

Keynes' and expectations

With regard to expectations, Keynes challenged the view that single valued subjective expectations could be uniquely defined. His argument rested on the belief that individuals possessed only scanty information about uncertain future events. Drawing on his experience as an investor in financial asset market, he describes the stock market as casino and describes the behavior of short-term speculators expecting immediate capital gains. He concluded that the market may converge to any number of guesses, each of which might be self fulfilling but arbitrary and this will make the economist have little hope of modeling the level of expectation. That is in the modeling of endogenous expectations revision is fraught with difficulties. And in order to address these difficulties, he treated expectations, as exogenous in the short-run and this places individual relations within a modern intertemporal framework.

In applying the Keynes' motive of treating expectations to the permanent income- life cycle model of consumption. Permanent income is the constant hypothetical stream whose present discounted value equals the present value of expected actual income plus any initial wealth. It is asserted that consumption will vary with permanent income, since individuals make long-run decisions subject only to long-run budget balance. However, if it is assumed that expected future incomes are exogenous and temporarily fixed, the important variation in permanent income in the short-run will be induced by variation in current income. Moreover, since current income and income in the immediate future represent only a part of permanent income, variation in the former will induce a smaller variation in the latter, so that, it will be expected that marginal propensity to consume out of current income would be positive (Kuznets, 1946).

In addition, when expectations of future operating profits are held exogenously constant, the most important determinant of investment decisions will be the rate at which such expected profits are discounted. Individual extrapolate past output levels to form expectations about future output and hence future profits to use within the conventional discounting formulation of investment decision. In conclusion, when the discounted benefits of parents investing in their child exceed the cost, then with this expectation, parents would invest more in their child education.

Adaptive and rational expectations

Adaptive expectation as introduced by Cagan (1956), postulate that individuals use information on past forecasting errors to revise current expectations. That is to say that adaptive expectation hypothesis asserts that individual expectation is based on information available at the end of the period. In adaptive expectation hypothesis, it allows to model unobservable expectations purely in terms of past observations of relevant issues without the need to specify the process by which the initial level of expectations are determined. In conclusion, it also emphasizes that the behavioural rule is really an assertion that current expectations are based on an extrapolation of the past information. Applying this concept to parents in Ghana, it means that for parents' investment in their children' education, would be based on past information gathered about children who enrolled in school.

However, due to the backward looking nature of the adaptive expectations, Muth (1961), formalizing the work of Modiglian and Grunberg (1954) introduced an alternative theory about expectation and this is referred to as rational expectations. It is concerned with incentives to acquire information and exploit profitable opportunities for revising behaviours. In conclusion, parents' decision to invest in their children's education can be said to belong to both adaptive and rational expectations of the parents in Ghana.

A brief history of education and educational policies in Ghana

According to Heckman and Masterov (2004), formal and informal education is seen to shape the potential of a maturing person. Informal education, which results from the constant effect of the environment and its strength in shaping values and habits, cannot be overestimated (Fahra, 2005). Formal education is the conscious effort by human society to impact the skills and modes of thought considered essential for social functioning (Lehman & Verhine, 1982). Techniques of instruction often reflect the attitudes of society, i.e. authoritarian groups typically sponsor dogmatic methods while democratic systems may emphasise freedom of thought (Dewey et al., 2000). Education for free men was the reason for studying mathematics, music and gymnastics (Pond, 2002).

According to Knowles (1980), higher education was carried on by Sophists and other philosophers. In medieval Western Europe, education was typically the responsibility of the church: the monastic schools and universities were the chief centres. Lay education consisted of apprentice training for a small group of the 'common people', or education in chivalry for the more privileged (Olsen, 1999). During the Renaissance, education of boys and some girls in classics and mathematics became widespread. It was after the Reformation that both Protestants and Roman Catholic groups began to offer formal education to more people (Hake, 2010). There was then a great increase in the number of private and public schools. However, the development of scientific inquiry in the 19th century brought new methods and materials of learning and teaching (Iacopetta, 2011). As elementary and secondary schools were established and a

larger proportion of the population attended these schools, curriculum became differentiated and included vocational education. Opportunities for higher education were expanded (Dewey et al., 2000).

In Ghana, education in pre-colonial era was by traditional methods by which both males and females were prepared for adult roles. The arrival of the Portuguese, British, and the German missionaries and government representatives changed the system radically. Though the government control of curricula was increased, religious influence was still quite noticeable. Governor Guggisberg was very influential and innovative as he attempted to meet the needs of Ghanaians for development. Both female and technical education, quality of instruction, as well as the usual liberal arts orientation was promoted (Stuart and Tatto, 2000).

The development of education in Ghana since independence has been and continues to be guided by various educational acts and programmes, the most fundamental being the Educational Act of 1961 which was the principal legislation on the right to education. The 1992 constitution gives further impetus to the provision of education as a basic right for all Ghanaian. In 1996 the Free Compulsory Universal Education Programme (fCUBE) was launched. It was a 10-year Programme (1996-2005) designed to establish the policy framework, strategies and activities to achieve free and compulsory basic education for all children of school going age and this was to increase school enrolment in the country.

At the governmental level, efforts were made to reduce poverty. Human resource development was identified as one of the major areas for accelerated growth and this was included in the Growth and Poverty Reduction Strategy (GPRS I & II) plan for Ghana. The policy issues that were intended to be addressed were inadequate progress in school enrolments, persistent geographical and gender disparities in access to education and other related issues to development. The educational reform policy aimed at addressing weaknesses of the existing educational system, with a view to making more progress in school enrolment rate. The essential elements of the reform include, among others, the following: re-structuring of the current Basic Education System to provide universal compulsory basic education comprising 2 years of kindergarten, 6 years of primary, 3 years of Junior High and 3 years of Senior High, improving institutions to provide education for children with special needs; improving Teacher Education, including teacher development at all levels of education, and formalization of community-based apprenticeship/skills training.

Some of the key measures that the government implemented in 2007 meant to further improve gender parity, especially at the primary level, included the supply of school uniforms, school bags and stationery to girls and radio programmes, to promote girls' education in the various districts. All these policies were adopted by Convention People Party (CPP), Provisional National Defence Council (PNDC), National Patriotic Party (NPP) and the National Democratic Congress (NDC) governments to achieve 100 per cent school enrolment at the basic level.

Empirical Literature Review

Expectation and educational investment

When estimating future rewards, parents may take their children's employment prospects into account, by looking at the local labor market opportunities. In countries where agriculture is a major sector, parents are less likely to invest in their children since most available jobs require little education (Smits & Gündüz, 2006; Buchmann & Brakewood, 2000; Colclough et al., 2000). Sakwa (2006), for instance, found in Kenya that students were ambivalent about education as a means to poverty alleviation, because they realised that having more education did not guarantee a higher income. Since a job in the formal sector requires at least primary education, parents are more likely to send their children to school if formal job opportunities are realistic. If it is easier for men than for women to find a (well-paid) job, parents may also take their child's sex into account (Song et al., 2006; Buchmann & Brakewood, 2000; Colclough et al., 2000).

Labor market prospects are not the only key factor that influences parents' decision on investment in children's education. Also in the absence of pension schemes, as is the case in most developing countries, children are supposed to provide for their parents when they are old. This means that, when considering the education of their children, parents will not only take the future returns to their children into account, but also the expected returns to them. In cultures where sons are reckoned to look after their parents in old age, parents are more likely to invest in their boys. This is not limited to their sons' education only, but may also

include investment in their health, etc. Moreover, this also means that in cultures where ‘‘a girl’s allegiance after marriage is mainly to her future husband’s family, the balance of perceived benefits to parents is likely to favor the education of sons over daughters” (Colclough et al., 2000, pp. 16).

Zhan and Sherraden (2011), in their study on assets and liability, education expectations of households found financial assets are positively associated with education expectations of parents. This implies that for parents to invest in their children’s education, they considered the financial benefits they would derive from such investment. Again, Zhan (2006) examines the relationships between parental assets with their expectations and involvement of children's education. Through the analysis of the mother–child data set of the National Longitudinal Survey of Youth (NLSY79), found parental assets were also positively associated with their expectations and involvement of children’s school activities.

However, some scholars cast doubt on this assumption. Eloundou and Eloundou and Calve (2006), for instance, found for patrilocal[1] regions of Sub-Saharan Africa, that daughters remitted substantially to their parents and that the remittances increased with education of the daughters. Levine and Kevane (2003) noticed for Indonesia that virilocality[2] does not influence investments in daughters’ education. The importance of such marriage traditions for investments in girl’s education, therefore, still remains an open question.

[1]This refers to a social system in which a married couple resides with or near the husband’s parents

[2]This is the practice where daughters move away from their parents upon getting married

Besides labor market structure and culture, another closely related characteristic of the expectation that may play a role is the degree of modernization (as indicated by the level of development or degree of urbanization). At times, there is generally impact of globalization, including the diffusion of value patterns that stress the importance of education and equality among sexes. The expectation of parents that their children should meet the challenges of globalization in the future encourages them to enrol the children in school. Also according to status attainment theory (Treiman & Ganzeboom, 1990), in more modern areas there are fewer possibilities for parents in higher positions to ascertain a good position for their children through direct occupational transmission or transference of capital. These parents, therefore, are expected to invest more in their children's education, which would lead to a stronger effect of parental education and occupation on educational enrolment.

Human capital and productivity

Investment in education leads to the formation of human capital. The role of human capital development in increase productivity has been the focus of public debate in recent times. According to Schultz (1961) and Strauss and Thomas (1995), economic prosperity and functioning of a nation depends on the physical and human capital stock of the nation. The theoretical framework underpinning this is the human capital theory which rests on the assumption of education being the basis for human capital formation (Psacharopoulos & Woodhall, 1997; Sakamota & Powers, 1995; Schultz, 1971). According to

Fagerlind and Sahn (1997), human capital theory provides a basic justification for large public expenditure on education, both in developing and developed nations. Babatude and Adafabi (2005), Lucas (1998), Rebelo (1991), Grossman and Helpman (1991) and Romer (1990), viewed human capital as an alternative engine of increase productivity. The major contribution to the issue on the relationship between education and productivity was first made by Adam Smith, followed by Marshall, Schultz, Bowman and others (Tilak, 2002).

However, to boost human capital, a country has to invest more in education. According to Dahlin (2005), an investment in education is very beneficial to the society, both at the micro and macro levels. That is, education is considered as the key catalyst for national development; increase in productivity is generally assumed to be explained largely by stocks of labour, physical capital and human capital (the quality of the labour force) (Lucas, 1998). Technology is assumed to be part of the growth equation, and the rate of technological change is associated with the availability of highly educated workers. Hanushek & Wößmann (2007) and Barro (2001), using a cross country growth regression, found that each year of schooling boosts long -run productivity by 0.58 and 0.44 percentage points respectively. In other to conclude on this relationship between education and productivity, Rebelo (1991) introduced physical capital as an additional input in the human capital accumulation function. However, the model of endogenous growth by Romer (1990) assumes that the creation of new ideas is a direct function of human capital, which manifests in the form of knowledge. As

a result investment in human capital led to growth in physical capital which in turn leads to increase productivity.

Other studies that supported the human capital accumulation as a source of increase productivity includes Benhabib and Spiegel (1994), Barro and Lee (1993) andRomer (1990). Haouas and Yagoubi (2005) examined openness and human capital as sources of productivity growth for Middle East and North Africa (MENA) countries. Controlling for fixed effects as well as endogeneity in the model, they found that while human capital significantly influences productivity, it has no underlying effect on productivity growth. Park (2006) investigated the growth implication of dispersion of population distribution in terms of educational attainment levels. Based on a pooled 5-year interval time-series data set of 94 developed and developing countries between 1960 and 1965, the study revealed that the dispersion index as well as average index of human capital positively influences productivity growth. He concludes that education policy that creates more dispersion in the human capital will promote increase productivity. Similarly, but in a slightly different manner, Loening (2002) investigated the impact of human capital on economic growth in Guatemala through the application of an error correction methodology. He examined two different channels by which human capital is expected to influence growth. The result from his study revealed that a better-educated labour force appears to have a positive and significant impact on economic growth both via factor accumulation and on the evolution of total factor productivity.

Barro and Lee (2000), in a cross-country study, concluded that higher ratio of human capital to physical capital and higher school attainment tends to generate higher productivity in the long run. In conclusion, growth is positively related to the starting level of average years of school attainment of adult males at the secondary and higher levels. Since workers, with this educational background would be complementary with new technologies, the results suggest an important role for the diffusion of technology in the development process.

The works of such scholars as Glewee et. al. (2001) and Lucas (1998) on education, concluded that education also contributes to increase productivity by improving health, reducing infertility, and possibly, by contributing to political stability. Although the link between education and labour productivity is not entirely clear, general knowledge and learning skills, acquired in school, are usually assumed to make for more flexible workers, capable of acquiring new skills and adapting to new working environments. The importance of education and human capital has been brought out in many studies of economic growth and development. Barro (1991) developed a human capital model, which shows that education and the creation of human capital were responsible for both the differences in labour productivity and the differences in the overall levels of technology that we now observe in the world. More than anything else, it is the spectacular growth in East Asia that has given education and human capital their current popularity in the field of economic growth and development (McMahon, 1998). Countries such as Hong Kong, Korea, Singapore, and Taiwan have achieved unprecedented rates of economic growth while making large

investments in education (World Bank, 2002). Olaniyan & Okemakinde (2008) and McMahon (1998) found that improvement in education is a very significant explanatory variable for East Asian economic growth.

According to Justi and Driel (2006), there are several ways of modeling how the huge expansion of education accelerates economic growth and development. The first is to view education as an investment in human capital. A different view of the role of education in the economic success is that education has positive externalities (Psacharopoulos & Patrinos, 2004). The idea that education generates positive externalities is by no means new. Many of the classical economists argued strongly for government's active support of education on the grounds of the positive externalities that society would gain from a more educated labour force and populace (Van et al., 2006). Smith (1976) reflects such progressive contemporary thought when he wrote that by educating its people, a society derives considerable advantage from their instruction. The more they are instructed, the less liable they are to the delusions of enthusiasm and superstition, which, among ignorant nations, frequently occasion the most dreadful disorders. Besides, instructed and intelligent people are always more decent and orderly than ignorant and stupid ones. Smith views the externalities to education as important to the proper functioning, not only of the economy but of a democratic society.

Another way of modeling the role of education in the growth and development process is to view human capital as a critical input for innovation, research and development activities (Barro et al., 1995). From this perspective, education is seen as an intentional effort to increase the resources needed for

creating new ideas, and thus, any increase in education will directly accelerate technological progress. This modeling approach usually adopts the Schumpeter (1973) assumptions of imperfectly competitive product markets, and competitive innovation, which permit the process of generating technological progress. Education is seen as an input into the intentional and entrepreneurial efforts to create new technology and new products (Barro, 1991). Proponents of this view of education point out the close correlation between new product development and levels of education (Barro & Lee, 2000). Countries that are at the forefront of technology also have the most educated population (Van et al., 2006).

Gupta and Chakraborty (2004) developed an endogenous growth model of a dual economy where human capital accumulation is the source of economic growth. They argued that the duality between the rich individual exists in the mechanism of human capital accumulation. Rich individuals allocate labour time not only for their own production and knowledge accumulation but also to train the poor individuals. In a different dimension, Bratti et al. (2004) estimated a model of economic growth and human capital accumulation based on a sample of countries at a different stage of development. Their result revealed that the increase in the primary and secondary level of education contributes to an increase in productivity. They posit that human capital accumulation rates are affected by demographic variables. For example, they established that an increase in life expectancy at birth brings about an increase in secondary and tertiary education while a decrease in the juvenile dependence rate negatively affects secondary education. Finally, they added that geographic variables have a

considerable importance in the human capital accumulation process. Nevertheless, studies differed on the impact of human capital on productivity growth.

An empirical work by Barro and Lee (2000) shows that cross-country regressions have shown positive correlation between educational attainment, economic growth and development. Odekunle (2001) affirms that investment in human capital has positive effects on the supply of entrepreneurial activity and technological innovation. Ayeni (2003) asserts that education, as an investment, has future benefits of the creation of status, job security and other benefits in cash and in kind. In conclusion, various authors have found a positive relationship between economic growth and education at all levels.

However, Ayara (2002) reports that education has not had the expected positive growth impact on economic growth in Nigeria. Hence, he proposes three possibilities that could account for such results, which are that Educational capital has gone into privately remunerative but socially unproductive activities; or there has been slow growth in the demand for educated labour; or the education system has failed, such that schooling provides few (or no) skills. In conclusion, we can say that education has a positive link with productivity, therefore parents' needs to invest in their children education to promote increase productivity and development.

Importance of early childhood education

Armed with an awareness of potentially sizeable benefits of early childhood programs, policymakers in a number of states have made publicly

funded preschool an important part of recent education reforms. The main attractions of preschool programs appear to be their potential for prevention of future crime. As described by Heckman and Masterov (2004), the main mechanism through which early education affects labour force productivity and crime is through its effect on cognitive and non-cognitive skills. Prevention of learning problems in the early school years may be more cost effective than waiting until late adolescence or early adulthood to offer costly and less effective treatment or training for those experiencing difficulties graduating from high school, finding a well-paying job, and staying away from crime (Heckman, 2000). Policies that increase educational attainment can be an alternative to job training programs offered to increase the readiness of youth and young adults for the labour force. These training programs have been extensively evaluated and the results suggest that they have high costs and relatively low benefits associated with them (Heckman & Masterov, 2004). These findings suggest that policies to increase high-school graduation rates can affect economic growth through their effects on labour force productivity (DeLong et al., 2003). Hence, we can expect that labour force productivity and economic growth can be enhanced by investments in early childhood educational programs.

With respect to juvenile crime, most of the expenditures are allocated for the treatment of families and children after problems have occurred rather than for prevention through early intervention (Aos et al., 2004). Social scientists have long noticed a strong relationship between educational attainment and crime (for an attempt to generate causal estimates of the effects of education on crime

(Lochner & Moretti, 2004). As in the case of labour force readiness discussed above, the findings that preschool programs can increase high-school graduation rates suggests that preschool interventions, especially high-quality programs offered to children from disadvantaged backgrounds, can be expected to reduce crime.

In addition, investing in early education generates economic development for communities in the short run in the form of jobs, the purchase of goods and services, and a more efficient workforce. In the long run, quality early education builds an employable, educated workforce which leads to economic development and benefit to the parents.

Returns to education

The rate of return to education has been widely studied since the late 1950s. The conventional approach used to estimate the returns to education was the standard Mincerrian earnings function, introduced by Mincer (1974). Setting the logarithm of earnings as the dependent variable, the number of years of schooling as an independent variable, and controlling for the number of years of experience and other individual characteristics, the years of schooling coefficient is interpreted as the private rate of return to education. Even though the Mincerian model is a standard method for estimating the rate of return to education, it suffers from endogeneity bias, arising from a correlation between years of schooling and omitted factors in the error term. Grilliches (1977) states that the schooling coefficient from the least squares estimator is biased upward under three

assumptions: (1) the omitted factor is "ability" that positively correlates with earnings, (2) the excluded ability variable positively correlates with the schooling variable, and (3) the ability variable is the only variable that is excluded. Some studies take ability into account in the estimation by employing various Instrumental Variables (IV) such as the quarter of birth (Angrist & Krueger, 1991) and distance to school (Kane & Rouse, 1993). However, Bound et al. (1995) found that the results from IV estimation become less accurate than OLS estimates. Card and Lemieux (2001) conclude that IV estimates of the rate of return to education will be higher or lower than OLS estimates depending on the choice of instrumental variables.

In order to determine the benefits associated with education, Psacharopoulos (1972) formulated a theory for the evaluation of investment in formal education. A stream of benefits was compared to a stream of costs by means of a discounting process. In identifying and measuring the benefits and costs, however, every kind of investment has its own peculiarities. Psacharopoulos and Patrinos' (2004) empirical study of the returns to education across 98 countries observed that having formal education continues to exhibit the highest social profitability in the world. In addition, the mean coefficient of schooling in the Mincerian equation across studies of Asian countries shows a 9.9 percent rate of return, compared with a 7.5 per cent rate of return for Organisation for Economic Co- operation and Development (OECD) countries. This difference reflects the phenomenon of diminishing returns to accumulation of human capital, given the higher mean levels of schooling in the OECD countries. Again

Psacharopoulos and Patrinos (2004) found that the global average rate of return to education is estimated at 10% and is used as an indicator of the productivity of education.

Another notable finding from this survey is the tendency for returns to education to be higher for men than for women, which could also reflect the lower base levels of education of females compared to males in the developing world (Nunoo, 2009). In addition to the private returns to education in the form of increased wages, (OECD, 2000; Blundell et al., 2001) emphasize two other aspects of returns to education: social returns and gains in labor productivity. McMahon (1999) analyzed various "non-monetary" social returns to education such as decreases in crime rates and fertility rates, and an improvement in environmental protection. Furthermore, McMahon (1999) uses cross-country analysis to address the impact of education on political and human rights, which may subsequently affect the rate of economic growth. Additional studies by McMahon and his colleagues estimate the contribution of education to the various aspects of economic development, such as the impact on rates of economic growth in East Asia (McMahon, 1998), on infant mortality rates in OECD countries, and on health in Africa (Appiah & McMahon, 2002).

The review by Psacharopoulos (1994) did not go without criticism. Bennel (1996) argued that Psacharopoulos' (1994) conventional rates of returns patterns almost certainly did not prevail in sub-Saharan Africa under current labour market conditions. First, Bennel alluded to the fact that the data and methodologies that were used in the individual country studies were deficient and/or incompatible.

Also, he argued that the countries were of different sizes and economic circumstances. Looking at the chronically low internal and external efficiencies at all education levels in Sub-Saharan African (SSA) countries, he noted that it seems highly implausible that rates of returns in sub-Saharan Africa are higher than in advanced industrial countries.

Booth et al. (2007) modeled educational investment and hours of work in a competitive labour market in which heterogeneous workers have different productivities, both at home and in the workplace. They show that there are increasing returns to education at the participation margin and that these arise for two reasons. First, workers with greater workplace skills receive better wage offers and so are more likely to participate in the workplace, and a higher participation probability raises the ex ante expected marginal return to human capital investment. Second, there is an increasing labour supply effect that arises because more educated workers may find it worthwhile to work longer hours. This further increases the marginal return to schooling. Those individuals most likely to be affected in this way are those types with large enough home productivity, who may be either involved in home or black market production, or may be characterized by a strong preference for other non-market sector activities. Their model demonstrated how the importance of increasing returns to education varies across individuals. An important theoretical contribution they showed in their paper was that the presence (or absence) of increasing returns to education is closely related to the elasticity of labour supply, with respect to income.

Specifically, Booth et al. (2007) show that the marginal return to schooling is increasing in education where the elasticity of labour supply with respect to income is more than one. Conversely, there are decreasing returns if this elasticity is negative (and is otherwise ambiguous). Because this labour supply elasticity is sensitive to home productivity, it is not surprising that different individuals with different home productivities face different investment margins. As an illustration, they estimated a three-equation recursive model of working hours, income and years of schooling, using new data for Britain. They found empirical support for the main predictions of the model with regard to increasing returns to formal education once labour supply behaviour is taken into account.

Foltz and Gajigo (2007) assessed the returns to education in the Gambia. Using three nationally representative surveys and exploiting the exogenous variations in the availability of schools by division when individuals were born, they were able to obtain consistent estimates of returns to education. This figure was significantly higher than other estimates of returns to education in developing countries in general (Psacharopoulos, 1994) and many recent estimates for West Africa, in particular. Returns to education were still high and significant when household income was considered. A major challenge is explaining such a high return to schooling in the face of low school attendance in the country.

The result of Foltz and Gajigo (2007) suggested that the presence of constraints might prevent households from fully exploiting the high returns to schooling. School attendance was found to be highly correlated with household

income and proximity to schools, suggesting that the direct cost of sending children to school is a major factor. Their results also suggested that households may discount returns to formal education in the urban sector because it is a very small sector relative to agriculture in the Gambian economy. This effect seemed to be exacerbated by the fact that the agricultural sector in the country has not experienced any significant technical change that is likely to reward education. And, finally, the high-paying public sector (rural sector) has a barrier to entry since nepotism plays a significant part in an individual's likelihood of being employed. These non-meritocratic barriers to entry into the public sector also possibly reduce potential school attendance, despite the lack of evidence for higher returns to formal education in the urban sector (Ayara, 2002).

On the study of returns to education in Thailand, Chiswick (1977) first introduces an estimation of the earnings function in Thailand as a case study for developing countries. In addition to a regression on the Mincerian model, the paper develops a technique for analysis of earnings by self-employed workers. One finding is that the estimated coefficient on schooling for women is higher than for men. Amornthum and Chalamwong (2001) updated the rate of return to education in Thailand in 2000 using the framework of the World Bank, applying OLS to the basic Mincerian equation, but adding dummy variables such as location and marital status as controls. Contrary to Chiswick (1977) he found that the rate of return to education is higher for men than for women. The most recent study is conducted by Hawley (2004) who studies the effect of the macro economy on returns to education in three different years (1998, 1995and 1985),

finding that the rate of return is stable across time and between genders. A study by the World Bank (2006) reveals that returns to education in Thailand, especially at the higher levels of schooling, are greater than those found for other countries in the region.

With regard to "non-monetary" returns to education in Thailand, another report from the World Bank (2006) discusses gains in the form of improved health and intergenerational spillovers. For example, a higher education level has a significant relationship with "awareness about HIV/AIDS transmission and protection" (World Bank, 2002), and with the incidence of other serious diseases such as malaria, goiter, and tuberculosis. Across generations, more highly educated parents are likely to have children with greater levels of schooling and socio-economic mobility.

Godana and Ashipala (2006) investigated the relationship of rates of returns to formal education and school quality in Namibia, using the Mincerian method. Based on an extensive survey of households and a record of school resources for almost 20 years, Godana and Ashipala (2006) matched individuals to the schools they attended during their schooling years and found that quality changes across schools and also for individual schools. The study found very little impact on the rate of returns to education to the individual and the society. In addition, they also found significant distortions and imperfections in the labour market, which perhaps overshadow the impact of education to the individual and the society. However, studying the benefit of education to the individual in different categories, returns to education was much higher for whites and coloured

than for blacks. In addition, men had higher returns than women. Living in urban areas raised the returns compared to rural workers and unionized labour had higher returns than those who did not belong to a union.

Paul (1990) on the study of technical secondary education in Togo and Cameroon reached the same conclusion as Psacharopoulos (1994). He found that returns to education are positive and in some cases higher than returns to investment in other sectors of the economy. Primary education gives the highest returns. Thus, he concludes, like Psacharopoulos, that investment in primary education should be emphasized and that individuals willing to pursue further formal education should be made to bear a higher proportion of the cost of such education. Måns et al. (2006) also investigated the shape of the earnings function. They found out that there was strong evidence that the earnings function is convex for both Kenya and Tanzania. In a different study on the Nigerian economy, Okuwa (2004) used data from the 1995 Nigerian labour market survey to examine the returns to formal education. For formal education, the returns to schooling were higher than those with informal education Nunoo (2009). The returns to schooling also increased as higher levels of schooling were attained. Jones (2001) on the study of educated workers concludes that apart from increase in their productivity, returns to education also increases with the level of schooling. A noteworthy feature in the results is that the returns to education are quite different across the sectors of employment. In the informal sector, the returns to primary education and those to vocational and secondary general education exceed by a relatively large margin. A decomposition of the wage

differentials, across the sectors of employment indicates that personal endowments, particularly in terms of educational attainment, are more important in accounting for the income gaps, than are the differences in their impact on future income.

Using a nationwide household survey data, Asadullah (2005) examines the labour market returns to education in Bangladesh and observed that an additional year of schooling increases labour market earnings by seven (7) percent. Estimates of returns are separately reported for rural and urban work places, males and females, as well as public and private sector individuals. Substantial heterogeneity in returns is observed; e.g. estimates are lower for rural sample (than urban sample) and higher for females (compared to their male counterparts) and a notable finding of the study is the substantial non-linearity in returns to education in Bangladesh. Consistent with many findings in the literature, Cortez (2001) shows that future income rises with formal education. Irrespective of gender and year of analysis, the magnitude of impact rises with schooling and the statistical significance also becomes stronger. For female workers, the returns to schooling have increased faster than those for informal education.

Estimating returns to formal education in Ghana, and using a modified Mincerian earnings function Twum (2006), established that the mean annual earnings of workers increase with more years of formal education. It has also been found out that the returns on formal education were higher for females compared to their male counterparts in both urban and rural sectors of the economy. In examining the productive nature of education, Jones (2001) used an

unusually rich data set from Ghana which matches information on workers' characteristics with information on the firms, where they are employed. These data enabled him to compare the productivity and earnings differentials between different groups of workers. Two primary questions were addressed: (1) Are educated workers more productive than workers with no formal schooling? and (2) do earnings differentials between workers with different levels of education reflect genuine productivity differentials? Evidence from Jones (2001) indicates that education and productivity are positively correlated, and that firms pay workers according to their productivity. He also found that workers with formal education are more productive than those with informal education; and workers with formal schooling are more productive than those with no formal education. The data he used indicated that the Ghanaian labour market works remarkably well, even by standards of the developed countries. On the average, the relative earnings and productivity differentials between different groups of workers are equivalent. This result implies that the estimated returns to schooling based on Mincer's model provide a good estimate of real productivity differentials.

In conclusion, a critical assessment of rates of return to schooling in Ghana should be examined. Glewee et al. (2001) illustrated the pitfalls in using data from Ghana and questioned the usefulness of those estimates for government investment decisions. He found out that when school quality varies widely across time and space, years of schooling may be a very imperfect indicator of human capital attained and that simple estimates of returns to schooling may be substantially biased. Lastly, the study established that estimates of return to

schooling may be of little relevance to education investment decisions in many developing countries, even when properly adjusted to be social rates of returns. Rate of returns to schoolings may be of little use without information on the quality of schools in countries where the main problem is low quality and stagnating enrolments.

Determinants of school enrollment

There are many studies on what influences parents in enroling their children in school. Glick and Sahn (2000) studied school enrolment in Guinea and concluded that this depended on parents' wage rates and community environmental characteristics faced by the children. However, it is very important to note that wage alone does not reflect the opportunity cost of schooling which is very important in determining the willingness of parents to invest in the education of their children (Anderson, 2009). The availability of schools in the community, the distance travelled to school, the availability of well paying white-collar jobs in the community, and possibly the presence of others who have completed higher education from the community and have obtained good jobs might be very important (Lang & Ruud, 1986).

Yueh (2001) criticized the work of Glick and Sahn (2000) based on the fact that only household factors were considered as explanatory variables in the model to determine what influence parents to enrol their children in school. The importance of parents' expectation determining school enrolment cannot be over-emphasized. The absence of parents' expectation and other environmental

variables indicate a problem of misspecification due to the exclusion of relevant variables (Greene, 1993).

Kirchsteiger and Sebald (2010) in the study of investment into education indicated that the education of adults in a household has a significant impact on the enrolment of children in all countries studied while the effect of female adult education was larger than that of males in some countries. Connelly and Zhen (2003) study the determinants of school enrolment and completion in China found parental education, county level income and village level income rate also effects on enrolment. In addition, the presence of primary, first and second cycle institutions in the community has a significant effect on enrolment in some countries, notably in Western and Central Africa.

The effect, however, did not appear to differ systematically by gender of the child. Unlike Dewey et al (2000), the impact of family resources (wealth) is recognized by Pritchett and Filmer (1999) when they studied inter-country, using Demographic and Health Survey Data for the various countries. This data set does not normally include parents' expectations and for that matter the effect of this on school enrolment is missing in this study. As stated above, any good study of this sort must involve parents' expectations since they are very crucial in determining enrolment level of children. On the other hand, they did not consider the importance of parental decision making as a separate and important process without which enrolment of the child might not materialise. In addition, Mutangadura and Lamb (2003) study on variations in rates of primary school access and enrolment sub-Saharan Africa using a pooled cross-country

time series analysis find government expenditure on education, GNP per capita and debt categories are significantly associated with primary enrolment rates.

Another major factor influencing investments in children's education is the economic well-being of the household in which they live (Schultz, 1993). Children from families with more socio-economic resources have a higher probability of being in school.

Direct costs associated with education, such as fees, books, and uniforms, are less likely to be an obstacle to wealthier families. Opportunity costs of children such as their not being able to help at home, at the family farm, or by earning additional income through child labour are also likely to be less important to them (Basu, 1999). Moreover, wealthier families are less affected by credit constraints. Imperfect credit markets have been found to be a major obstacle for the education of children from poor families (Edmonds, 2006; Ersado, 2005; Thorbecke & Charumilind, 2002). However, sub-Saharan Africa is characterized by a considerable degree of inter household resource transfers (typically within the extended family) in support of children's education (Shapiro et al., 1995), and also by a substantial amount of child fostering often with a view to enhancing children's educational opportunities. Despite these influences, however, it is the case that the economic well-being of the household in which a child resides is a strong determinant of educational investment (Shapiro & Tambashe, 2001; Lloyd & Blanc, 1996). Chiswick and DebBurman (2006) on pre- school enrolment also found that parental characteristics such as income and education, number of

siblings, mother ‘s labour supply are the major factors that influences school enrolment.

Besides household income, the occupation and education of the parents are expected to play a role (Glick & Sahn, 2000). If the father is in a salaried employment, especially if he works in a non manual occupation, we expect him to be more aware of the importance of education and, therefore, to invest more in his children’s education (Marshal & Swift, 1999). The opportunity costs of going to school are believed to be more important for parents who are self-employed, such as (small) farmers, since they are more likely to expect their children to help out when there is much work to be done, like during harvests. This will especially be the case in countries where laws regarding compulsory education are not strictly enforced. It also seems plausible that children who are supposed to assist in the household more often are not enrolled in school. For example, if their mother is working, girls might be counted on to do the household chores.

On the other hand, employment of the mother might increase her power within the household and there are reasons to expect this to increase the chances of her children to get education. According to the resource theory of conjugal power (Rodman, 1972), the degree to which partners can influence important household decisions depends on the extent to which they bring in valued resources into the marriage. Lakwo (2007), for instance, found in Uganda that women who through their access to micro-credit were engaged in daily income-generating activities, gained the power to do things that social norm previously denied them. This indicates that mothers who are gainfully employed and hence

contribute to the household income have more influence on family decisions than women who are not employed. It seems likely that such more independent women may be better able to create the possibility for their children and especially for their daughters to go to school. On the other hand, when the mother is forced to work because of poverty, the daughters may have to take over her household tasks and therefore have fewer chances to go to school. The effects of mother's employment may thus differ depending on the circumstances.

With regard to the educational level of the parents, there is ample evidence that children from better educated parents more often go to school and stay in school (Måns et al., 2006; Smits & Gündüz, 2006; Ersado, 2005; UNESCO, 2004; Buchmann & Brakewood, 2000; Colclough et al., 2000; Becker &Tomes, 1976). Parents who have reached a certain educational level may want their children to achieve at least the same level (Marshal & Swift, 1999; Lloyd & Blanc 1996). For the educational enrolment of girls, the education of the mother might be especially important (Emerson & Portela, 2007; Chowdbury & Nath, 2002). Mothers who have succeeded in completing a certain level of education have experienced the value of education and know that it is within the reach of girls to complete that level. Therefore, we expect them to use the insights derived from their higher education to make sure that their daughters get educated (Michaelowa, 2000).

The gender of the household head has also been found to be a relevant influence on investments in children's education. Lloyd and Blanc (1996) conclude that female heads of households spend a larger percentage of the

household budget on children than do male heads. After controlling for the socioeconomic status of the household as well as other factors, they find that "children living in households headed by women are consistently more likely to be enrolled in school and to have completed grade four than children living in households headed by men" (Lloyd & Blanc, 1996). Further, their results indicated that gender differences in school investments in children tend to be minimal in female-headed households.

There is also evidence that household size and composition can influence the likelihood that any individual school-age member of the household is in school. This issue received considerable attention from Parish and Willis (1993) whose discussion of resource dilution suggests that large family size will tend to lower educational attainment for all children. At the same time, they noted that in many developing-country settings, a large number of children in the family can lead not to universal resource dilution but to improved opportunities for the late born. Once they begin to work, early born children continue to send or bring resources back to the family when family obligations are strong, credit constraints help produce large inter-temporal transfers among siblings" (Parish & Willis, 1993). Simons (1994) have argued that this sort of "sibling chain of educational assistance" is quite common in sub- Saharan Africa. More directly, Chernichovsky's (1985) study of Botswana found that the number of school age children in a household was positively related to the likelihood of a child being enrolled in school. He interpreted this finding as reflecting reduced demand for

the labor of any individual child at home when more children are available, and hence a lower opportunity cost of schooling.

Ridker (1997) examined household schooling decisions in Tanzania, and utilized several household and individual level surveys to investigate declining primary enrolment rates, delayed entry into primary school and low enrolment at the secondary school level. He estimated the rate of return to schooling and costs of schooling (both direct and indirect) and concluded that low private rates of return for wage earners at both primary and secondary schools levels coupled with the high direct costs at the secondary school level negatively affected school enrolment. In addition, they recognized the impact of high opportunity costs, especially for girls, in lowering their enrolment. He also found out that household income, household costs, late starts significantly affect enrolment of children at the secondary school level.

Also, both quantity and quality of schools are important for educational participation, especially of specific groups like the poor and girls (Ersado, 2005; Buchmann & Hannum, 2001; Colclough et al., 2000; Michaelowa, 2001; Vasconcellos, 1997). The case for quantity seems obvious: when there are no schools or teachers available, children are not able to acquire education. Also the distance to school is expected to play a role. Colclough et al. (2000) concluded that schools are mostly attended by children living in the neighborhood. They found that in Ethiopia, children live on average one kilometer and in Guinea two kilometers from school. However, in both countries, schools served a much larger area, suggesting that children who lived further away were less likely to be in

school. Glick and Sahn (2000) found for Madagascar that distance has a strong negative impact on demand for schooling. The same applies to multi grade teaching, whereby several grades are taught simultaneously by one teacher. Glick and Sahn concluded that adding teachers to existing schools would be the most cost-effective way to reduce the problem of multi grade teaching without increasing the average distance to school.

Quality is also important. It determines to what extent children benefit from going to school. Parents tend to realize that their children gain less from low quality education, and may therefore be less willing to send their children to school (Buchmann & Brakewood, 2000; Colclough et al., 2000). An often used quality indicator is the Pupil Teacher Ratio, which indicates how many pupils there are for each school teacher in the district, and hence indicates average class size (UNESCO, 2004). For girls, the presence of female teachers has been found important (Leach, 2006; Dee, 2005; Colclough et al., 2000; Michaelowa, 2001). Male teachers might not provide girls with enough support, or might even be sexually threatening to them.

Huisman and Smit (2009) study on Household- and district-level determinants of primary school enrolment in 30 developing countries using multilevel analysis. Parental decisions regarding children's education are found to be influenced by socioeconomic and demographic household characteristics and characteristics of the available educational facilities, like number of teachers, percentage of female teachers, and distance to school. Other relevant context characteristics are urbanization and the position of women relative to that of men.

Interaction analysis shows that many effects of household-level factors depend on the context in which the household is living.

Nguyen (2006) examines the effects of parental social class, school quality and community factors on children's school enrolment in rural areas in Viet Nam, using logistic regression and ordered logistic regression. He found mothers status more important in determining school enrolment than the fathers' status. In addition, he found school enrolment to depend on the gender of the children in the household and finally the presences of schools in the communities does not override the effects of family back ground on educational enrolment.

In conclusion, the determinants of school enrolment discussed in the literature did not clearly indicate the theoretical foundations of the models. The mere collection of variables from everywhere, and incorporating them into a model might yield results as far as regression is concerned. This research tries to provide the theoretical underpinning regarding factors that influence Ghanaian parents to enrol their children in school.

Gender and investment in education

The gender gap in schooling is puzzling given that the expected returns to an individual for increased schooling — as measured by proportional wage increments — does not differ by gender. Gender differences in resource allocation within the household and the links between conditions in the labour market and parental investments in low income settings have been the subject of economic research (e.g., Pitt, Rosenzweig & Hassan, 1990; Thomas, 1990 and Rosenzweig

& Schultz, 1982). Many of these studies have underlined the importance of increasing female education in Least Developing Countries (LDCs) to reduce fertility rate (Abu-Ghaida & Klasen, 2004), to ameliorate child health conditions (Subbarao & Raney, 1995; Thomas, 1994, 1995; Haddad & Hoddinott, 1994), and to change the patterns of household consumption leading to a reduction in the income share spent on adult goods (Haddad & Kanbur, 1990; Rosenzweig & Wolpin, 1988; Folbre, 1984). Most of the literature on investment in child education mainly utilises the unitary model. Becker and Tomes (1976) on gender bias in education concluded that if returns to female education are lower than that of the male counterpart, parents would tend to prefer boys' education to that of girls'. In addition, when the cost of educating a girl is greater than the cost of educating a boy, parents might decide to invest more in boys' human capital and, possibly, to compensate the girls with cash transfer. Behrman et al, (1982) integrated the Becker and Tomes' unitary model by considering inequality-adverse parents, who care only about the efficiency of their investment. Only in the 'efficiency' case do parents tend to invest more in high-returns children. The unitary model has recently been criticized because of its weak theoretical foundations (Chiappori, 1992), its inability to be used to perform intra household welfare analysis (Rees & App, 1988), and its empirical failures in both developed and developing countries.

Hannum et al. (2009) investigate the gender gap in education in rural northwest China; parental perceptions of abilities and appropriate roles for girls and boys; parental concerns about old-age support; and parental perceptions of

different labour market outcomes for girls' and boys' education; gender disparities in investments in children, children's performance at school, and children's subsequent attainment. Using a survey of 9–12-year-old children and their families conducted in rural Gansu Province in the year 2000, along with follow-up information about subsequent educational attainment collected 7 years later. They found that vast majority of mothers still expected to rely on sons for old-age support, and nearly one in five mothers interviewed agreed with the traditional saying, "Sending girls to school is useless since they will get married and leave home." Compared to boys, girls faced somehow lower (though still very high) maternal educational expectations and a greater likelihood of being called on for household chores. However, there was little evidence of a gender gap in economic investments in education. Finally, they concluded that parents of sons and daughters tended to have high aspirations for their children. Parents sometimes viewed boys as having greater aptitude, but tended to view girls as having more dedication. Also, Alderman and King (1998), on *differences in parental investment in education*, explore possible explanations for the gender using a model of parental investment in children. The model allows for differences in investments due to differences in costs — including the opportunity cost of the child's labour as well as school fees and availability. It indicates that disparities in investment could come through differences in returns realized by parents, for example, in the probability of transfers from children to parents or in the degree of sympathy or altruism, even when market returns to the children themselves do not differ.

Furthermore, in the context of developing countries, Haddad et al. (1997) argued that using a unitary model as a guideline for policy prescriptions may lead to serious policy failures. In order to avoid the theoretical and empirical problems posed by the traditional unitary model, a new approach (McElroy & Horney, 1981) has been developed, starting from the Nash bargaining model (1953, 1950) where household decisions are considered the result of a bargaining process among family members who differ in their preference orderings and decision powers. Another important approach to the household decision process is the collective approach model developed by Chiappori (1992, 1988) in which decisions are assumed to be always Pareto - efficient with no restrictions imposed on the decision process. The literature has pointed to an observational equivalence (Behrman, 1997; Haddad et al., 1997): that there are cases where the unitary models and the collective models yield similar predictions. They further concluded that age - gender - composition also affects expenditure patterns and these are in favour of the male child in the household as parents are more certain of receiving support from their male child in the future than from the female child. They concluded that parents are willing to spend more on education where there is one child, and also that there may be more associated expenses for girls than boys in single-child households, such as on clothing, that are captured in the ‘other expenditure’’ category. Also, labour market discrimination will cause investment to differ for sons and daughters. Given perceived gender earning differentials, parents will invest more in their sons, in accordance with standard returns to education analyses.

Again, families tend to also demand education for their children when they know that the returns will be positive and can improve the standard of living of recipients and their families. Thomas (1994) concluded that the source of gender bias in education is related not only to the difference in costs and returns of schooling for girls and boys but also the different parental preferences and decision powers.

Glick and Sahn (2000) investigated the gender differences in the determination of several schooling indicators in poor urban environment in West Africa. They improved upon the study carried out by Dewey et al. (2000), modeled the schooling of the child as an outcome of the parents' utility maximization problem in an overlapping – generations model. Schooling of children appeared as a choice variable in the model. Reduced form of equation's, with the schooling indicators as the dependent variable, were estimated, using binary probit and the transition in schooling model, referring to whether or not the child left school in the last five years, was estimated, using the random effects probit method. They concluded that there is gender bias in parents' investment decision.

Song et al. (2006) study on *why do girls in rural China have lower school enrolment* found boys are more likely than girls to attend school in rural China. There is evidence that gender equity is a "luxury good"; the demand for female schooling is more income elastic than that for male schooling. Maternal education generally has a stronger effect on primary school enrolment and on educational expenditure than paternal education does. However, maternal education has a

weaker effect on girls' enrolment in secondary school than paternal education does. There appears to be no monetary return to schooling for women, but a modest benefit for men. Households also appear to face a higher opportunity cost when enroling young women than when enroling young men.

Studies by Schultz (1993), Parish and Willis (1993) unveiled that growth in household income raises private schooling investment for girls faster than boys, and concluded that policies that raise household incomes in general, increase gender equity in schooling, though this also depends on whether or not and how these policies change relative to the opportunity cost of girls and boys and the relative labour market returns to female and male schooling. They also maintained that interventions, targeted specifically at girls would have immediate beneficial impacts on the gender-schooling gap and such impacts are compounded inter-generationally, since maternal schooling strongly favours girls' education. The study concluded that there exist gender gaps in the schooling of children, with boys normally having the upper hand.

Using Demographic and Health Survey data for 57 developing countries, from various parts of the world, Pritchett and Filmer (1999) researched ways in which gender and wealth interact in generating - inequalities in boys and girls educational enrolment, attainment and assessed the partial relationships between educational outcomes such as gender, wealth, household characteristics and community characteristics. The author concluded that a large female-disadvantage in education is found in Western and Central Africa, North Africa and South Asia.

Angrist (1995) empirically tested differential labour market returns to male and female education as one potential explanation for large gender gaps in education in Pakistan by estimating private returns to education separately for male and female wage earners. His paper by using a variety of methodologies (Ordinary Least Squares, Heckman correction, 2SLS and household fixed effects) contributes to the literature in order to consistently estimate economic returns to education. When 2002 national representative household survey data of Pakistan was used, the earnings function estimated consistently revealed a sizeable gender asymmetry in economic returns to education, with returns to women's education being substantially statistically and significantly higher than men's.

However, a decomposition of employment to gender suggests that there is a highly differentiated treatment by employers. He concluded that the total labour market returns are much higher for men, despite returns to education being higher for women. This suggests that parents may have an investment motive in allocating more resources to boys than to girls within households.

Gender and returns to schooling

The perception that the benefits of education are lower for women can dampen demand for the education of the women (Daoud, 2005). Differences in female and male earnings are often presented as proof that returns to education differ by gender (Angrist, 1995). However, when evaluating the impact of schooling on productivity or earnings potential, one need to look at wage rates, not labor participation or earnings (Schultz, 1993). The labor supply behavior of

women is certainly partly due to the fact that education raises women's productivity in nonmarket as well as market activities, and staying at home may be the optimal option during parts of the life cycle. Evidence indeed suggests that education increases nonmarket productivity with respect to, among others, child survival or nutrition (Strauss & Thomas, 1995). It is then easy to see that the opportunity cost of time for these women who choose not to work for wages must be as great as or greater than the wages they refuse. This is what an economic model of labor supply, with standard assumptions, would predict.

Although the ratio of female to male wages has been rising globally and is closer to one than is the ratio of earnings, it has not reached parity even in the most advanced industrial countries. In 17 industrial countries in 1988, the level of women's (hourly) wages compared with men ranges from a low of 48.5 percent in Japan to a high of 90 percent in Sweden, with a median of about 75 percent (Filmer, 1999). In 14 Latin American countries (for the period 1988–90, with a few exceptions), this ratio ranged from 57.4 percent in Uruguay to 85.6 percent in Mexico, with a median of about 65 percent (Psacharopoulos & Tzannatos, 1992). That part of the female–male wage gap is due to the human capital gap between men and women is beyond dispute, as is the fact that different career paths taken by men and women have resulted in men having, on average, more market work experience and longer job tenure than women. Pregnancy, childbirth, and child care remove women from the workforce for a substantial number of years, and these withdrawals, even in the absence of wage discrimination against women, slow down their accumulation of work experience and often result in fewer

promotions and lower wages (Schultz, 1993b). Thus, it is difficult to ascertain the extent to which women's career choices are really voluntary and how much can be attributed to employer discrimination. To the extent that if employer discrimination exists, it affects not only wages but also women's opportunities to have more desirable and better paid jobs (Neumark & Koreman, 1994).

An important point to make is that it is possible to observe gender differences in wages without also observing gender differences in returns to schooling — that is, without observing differences in the proportional change in wages attributable to schooling. For example, Behrman and Deolalikar (1995) investigated the impact of schooling on wages in Indonesia, taking explicit account of sample selection in schooling choice. They found evidence which may be interpreted as wage discrimination, yet find that estimates of the proportional increment in wages that women receive for each additional year of primary schooling to be either higher relative to those for men or not different. They also found that secondary schooling has a 50 percent higher impact on the wages of women compared with men.

Indeed, the pattern of higher wage increments to schooling for females in the face of very low school investments is a common observation. Glick and Sahn (2000), for example, found this pattern for Guinea, a country where primary enrolment rates for boys are twice those for girls and secondary enrolments are three times higher (World Bank, 1996). These differences in per unit of schooling only serve to exacerbate the puzzle of the lower schooling investments in girls. Similar results have been found for Peru, although women's wages are lower than

those of men, at least at the primary level, the returns to education to men and women are quite similar in both urban and rural areas (Stelcner et al., 1987).

Determinants of educational expenditure in households

There have been many studies on what influence both parents in decision to spend on children's education Annabi et al., (2011) studied on expenditures on education, human capital and growth using OLG model analysis concluded that human capital formation depended on the amount of resources located to it. However, it is very important to note that human capital formation alone does not reflect the opportunity cost of parents forgoing present consumption to spend on children's education Foltz and Gajigo (2007).The number of children in the household, sex and marital status of the head, cost of education and the dependency ratio of the household are the factors that influence household expenditure on children's education.

There has been a conflicting literature on the relationship between the sex of the household and the educational expenditure in the household. Handa (1996) on the study of expenditure behaviour and children's welfare concluded that female headed household locates more resources towards children education than male headed household. Barros and Fox (1990) also on the study of female headed household, poverty and the welfare of children also confirmed the findings of Handa (1996). However, other empirical studies found that male headed household spends more on children education in the household than the female

headed household, because in female headed household the education expenditure is biased against male children in the household (Dwyer & Bruce, 1988).

On marital status and educational expenditure in the household, Handa (1996) concludes that the union status of the head of the household head have a significant influence of household educational expenditure behaviour with implications for the children. Also, Chant (1985) study on single parent families and also concluded that household with single parent spend less on children education that household with the two partners together. This is due to the fact that household with two partners pool resources together to send their children to school while the single headed household parents is mostly financially constraint.

Yousefy and Baratali, 2011; Allaeddini and Razavi, 2007 in the study on education and employment found that due to the positive relationship between education and employment, parents tend to spend more on their children's education to enable them get employment in the future. On the other hand, the educational level of the head of the household also determines household education expenditure on children. McElroy and Horney (1981) on their study on intra household decision found that the amount of resources household spend on children education depends on the educational level of the head of the household. They found a positive relation which indicates that head of household who had higher education spend more on children's education compared to their counterpart with less or no formal education.

Bhattacharya (2012) analyses up to what extent free education can reduce households' burden of private expenditure on education. It has been observed that

although the cost of education of those receiving free education is lower than those receiving paid education but in absolute terms there is significant expenditure on education by the households.

Also school level free education is almost non-existent and expenditure on education is incurred on all consumption expenditure quartiles. Therefore even the poor households have a proportion of expenditure going to education as students either do not receive free education or do not get it absolutely free. However, he concludes that item wise break up of expenditure showed that free education relieves a household only from paying tuition fees. There are other important items of consumption like books, stationery, uniform and most importantly private tuition consumed by students in all MPCE quartiles and paid for by households. Quality of educational institutions is also some of the factors found to determine household educational expenditure.

In addition, the presence of primary, first and second cycle institutions in the community has a significant effect on household educational expenditure. This is because the quality and quantity of schools in the community influences parents whether to enrol children in school or not. (Ersado, 2005; Buchmann & Hannum, 2001; Michaelowa, 2001; Colclough et al., 2000; Vasconcellos, 1997) Therefore, in communities that there are more schools with high quality, parents will enrol therefore children in school leading to increase in educational expenditure in the household. Household, absence of schools in the communities would discourage parents to enrol their children in school which would be accompanied by low educational expenditure in the household.

Another major factor influencing expenditure on children's education in the household is economic well-being of the household in which they reside (Rosenhouse, 1989). Families with more socio-economic resources have a higher probability of sending most of the children in the household to school. Sending children to school is associated with costs such as school fees, cost of excises books, and cost of uniforms. Families with high level of income are less likely to be constraints therefore will spend more to enrol children in school in the household. However, families with low income level have high opportunity costs of enroling children in school. In addition, households with fewer resources will be constrained to enrol children in the household in school result in low educational expenditure in household with low economic well-being. These findings are also confirmed by (Edmonds, 2006; Ersado, 2005; Thorbecke & Charumilind, 2002; Basu, 1999).

Urwick (2002) examines the variability of private expenditure on primary and pre-primary education in developing countries and its relationship with characteristics of household. He found that with regard to the gender of pupils, it has no significant correlation with household educational expenditure. However, the age of the child is seen to be significant and positively related. In addition, the mother's level of education, income and technology influence the amount of resource a household would allocate to children's education. Finally, he concluded that households with the head being a Christian spend more on children's education compared to households with Muslim head.

Shapiro and Tambashe (2001) examine gender, poverty, family structure and investment in children's education in Kinshasa and found that the family structure either matrilineal or patrilineal has a significant influence on the number of children enrol in school and the allocation of resources in the house towards children's education. In addition, Holden, Sear and Mac (2003) study on Matrilineal as daughter-biased investment and found that family also influence educational resource allocation in the household. They concluded that matrilineal family structure spend more on children's education but this expenditure favours female compared to male.

Also, the occupation of the parents is expected to play a role Lakwo (2007). If the father is in a salaried employment, especially if he works in a non manual occupation, we expect him to be more aware of the importance of education and therefore to spend more in his children's education (Marshal & Swift, 1999). The opportunity costs of going to school are believed to be more important for parents who are self-employed, such as (small) farmers, since they are more likely to expect their children to help out when there is much work to be done, like during harvests. This will especially be the case in countries where laws regarding compulsory education are not strictly enforced. It also seems plausible that children who are supposed to assist in the household more often are not enrolled in school. For example, if their mother is working, girls might be counted on to do the household chores. In addition, mother employment status might increase educational expenditure in the household, as she may assist the head by pooling resources together. If this happens, the household become less

financial constraint and spend more on children's education. The positive relationship between the mother employment status and educational expenditure is confirmed in the work of (Rodman, 1972)

There is also evidence that household size and composition can influence the likelihood that any individual school-age member of the household is in school. This issue received considerable attention from, Parish and Willis (1993), whose discussion of resource dilution suggests that large family size will tend to lower educational attainment for all children. At the same time, they noted that in many developing-country settings a large number of children in the family can lead not to universal resource dilution but to improved opportunities for the late born. Once they begin to work, early born children continue to send or bring resources back to the family when family obligations are strong, credit constraints help produce large inter-temporal transfers among siblings" (Parish & Willis, 1993). Simons (1994) have argued that this sort of "sibling chain of educational assistance" is quite common in sub-Saharan Africa. More directly, Chernichovsky's (1985) study of Botswana found that the number of school age children in a household was positively related to the likelihood of a child being enrolled in school. He interpreted this finding as reflecting reduced demand for the labour of any individual child at home when more children are available, and hence a lower opportunity cost of schooling. Therefore, with large number of children in a household, if parents decide to enrol all in school, the educational expenditure in the household would be greater compared to household where the number of children in the household is small.

Pritchett and Filmer (1999), measuring investment in education in the United States found that the average cost of enroling children in school influence the expenditure of the household. This means that if the average cost of enroling children in school is high, parents would spend more to send children to school.

On the other hand, if the cost of enroling children in school is low, less would be spend on children's education in the household. Therefore the average cost of education will influence the expenditure partner in the household.

The sex of the children in the household also has a great influence of education. Fortin and Lemieux (1998), Coverman (1983) and Barnes and Jones (1974), in their studies on the job market, conclude that there is discrimination against female in the labour market. This situation compels parents not to be willing to invest in their female child education compared to the male counterpart they consider have a greater chance in the job market. This implies that household that we have more of females in the household will see low level of educational expenditure as parents will not be willing to invest in their education. However, household which has majority of it children being male will tend to spend more on their education as parents consider them to be a better investment good than their female counterpart and this pattern is confirmed in the work of Alderman and Gertler (1997).

In conclusion, the determinants of school educational expenditure in the literature did not clearly indicate the implicit factors that influence parents but only focuses on the explicit factors. This research tries to identify the implicit

factors parents consider in addition to the explicit factors when making decisions on household educational expenditure.

Gender disparity and productivity

Barro and Lee (1996) and Barro and Sala-i-Martin (1995) in their study on the impact of gender inequality and economic growth included male and female year of schooling in their regression model. The coefficient on female primary and secondary years of schooling was found to be negative. They suggested that a large gap in male and female schooling may signify backwardness and may therefore be associated with lower economic growth. However, Dollar and Gatti (1999) introduced a dummy variable of Latin America into the model and found that the gender gap disappears in schooling between boys and girls. This suggests that the effect of the current result may be due to low growth and comparatively high female education.

Hill and King (1995) study the impact of gender differences in education on income. Instead of trying to account for growth of GDP, they related levels of GDP to gender inequality in education. They found that a low female–male enrolment ratio is associated with a lower level of GDP per capita, over and above the impact of levels of female education on GDP per capita.

Knowles et al. (2002) also estimated the impact of gender inequality in education on levels of GDP per capita in an explicit Solow framework, treating adult male and female levels of education as separate factors of production. The present study is based on estimating the impact of male and female education on

the long-run of GDP. They estimated these long-run level relationships based on average GDP per capita for 1960–1990 which they relate to average levels of male and female education for the same time period. With that they can then derive a growth elasticity of male and female education which measures the percentage increase of per capita GDP as a result of a percentage increase in male or female education. They find that female education has a significant positive impact on average GDP levels while male education has no significant impact. The estimated elasticity of the preferred specification is 0.37, i.e., a 1 percent increase in female education would increase the average level of GDP by 0.37 percent. Finally, they also investigated the matter in a growth regression framework to study the influence of female education on average growth during 1960–1990. There, they found a semi-elasticity of 0.21, suggesting that a 1 percent increase in female education would increase growth by over 0.2 percentage points.

. Dollar and Gatti (1999) also examine the relationship between gender inequalities in education and growth. They tried to explain five-year growth intervals (1975–1990) and attempted to control for the possible endogeneity between education and growth using instrumental variable estimation. In contrast to Barro, they found that female secondary education achievement is positively associated with growth, while male secondary achievement is negatively associated with growth. In the full sample, both effects are insignificant, but it turns out that in countries with low female education, furthering female education does not significantly promote economic growth, while in countries with higher

female education levels, promoting female education has a sizeable and significant positive impact on economic growth.

Klasen and Wink (2002) investigated the impact of gender inequality on economic growth, using the total years of schooling of male adults and the female – male ratio of that schooling as the variables capturing the effect of gender inequality. These two variables were used both in initial levels (in 1960) as well as in changes. The latter variable was the female–male ratio of the growth in the years of schooling during 1960–90. The analysis considered possible endogeneity using instrumental variables, panel data analysis, and other techniques. It also examined specifically different pathways by which gender inequality might influence economic growth. Apart from a direct impact, gender inequality might also indirectly affect economic growth through the effect it has on population growth, labor force growth, and the investment rate. In addition, the analysis generated reduced form estimates that measure the total impact of gender inequality on economic growth. Those regressions showed that both the initial ratio of female to male education has a significant positive impact on subsequent growth as does the female to male ratio of the growth of education.

In conclusion, we can say that there is a positive correlation between female education and productivity of a country as the health status of the family will be improved.

Risk and human capital investment

Levy and Clement (1996) and Tun-Wai and Wong (1982) in their study of investment on education, viewed education as an investment as well as a consumption good. The standard approach assumes that the individual invests an amount of time in education and then the return shows up in terms of enhanced future earnings. A remarkable flaw in the analysis of the investment in human capital is the failure to account for risk (Perira & Martin, 2002). When deciding on schooling, an individual will not only be interested in the expected returns but also in the corresponding risk. In fact, the perceived risk of the investment may well be a dominant concern in the decision making process.

The relationship between risk and returns is at the heart of financial investment theory. According to Hartog et al. (2002), investment in human capital carries a substantial risk and, therefore, the risk aspects in human capital are worthy of further consideration in human capital investment; since individuals are generally risk-averse in different degrees.

Various scholars have studied the relationship between risk and human capital investment. In particular, Palacios (2003) used mean-variance spanning tests to compare the properties of the returns to various human capital assets by comparing the efficient frontier in the mean-variance space, spanned by a subset of assets to that spanned by all assets. For example, human capital assets of white males were compared to those of white females in order to see if the mean-variance trade-off would be more favourable had the choice set been extended. He founds a wide dispersion in the returns per unit of risk for different human capital

assets. In addition, Christiansen et al. (2006) also using mean-variance to plot human capital assets and comparing the properties of human capital returns using a performance measure and tests for mean-variance spanning, concluded that inefficient investments are supposedly chosen for reasons other than investment purposes.

Also, Fitzsimons (2003) studied the effect of risky environment on the education of children in developing countries and concluded that the risk in human capital investment is not significant in child education. This result has a deficiency, as the dependent variable used was not very informative as to the stock of current stock of human capital of the child. The amount of resources that parents would invest in their children would depend on whether or not the parent is risk lover or risk averse. According to Razin (1972), with risk-averse parents who are uncertain about the future rate of return to human capital, the amount of investment in human capital is smaller than the certainty amount of investment in human capital; and the expected rate of returns to human capital exceeds the rate of returns to financial capital. Beneito et al (2001), using intra household model, explained that household characteristics and expected income determine household spending decisions.

Conclusion

Attempt in this chapter was made to show that there exists a grey area as far as the methodology for the estimation and the evaluation of the determinants of parents' decision of investment in children's education are concerned. Many of

the works cited in the review used national data such as the Demographic and Health Survey and Living Standard Measurement Surveys data which was principally meant for other measurements. Many of such data are not comprehensive enough to capture the numerous variables that are likely to affect the effectiveness of investments in children's education and, for that matter, educational enrolment.

In an attempt to disentangle the determinants of investment into the schooling of children, there is the need to use very comprehensive data from the household levels and school levels in addition to what might be available at national levels. The most important work noted in the literature review, which dwelt on determinants of investment in children's education and primarily school enrolment using household level data, is Glick and Sahn (2000). This particular work is somewhat limited in scope and methodology. Even though it used an Overlapping Generations Model in its framework, it is important to note that the import of the study was not to study the parental decision making process as it is related to the investment into the schooling of children. Besides, this study does not consider the uncertainty and expectation of parents, considering that influence parents in their decision. Due to this, the specification of the model was quite incomplete as it failed to recognize the effect of household involvement, which is very important in the determination of the opportunity cost of schooling of the child. Hence, it can be concluded that the debate on the effectiveness or otherwise of the determinants of investment decision of parents on child education is not yet conclusive. Therefore, the study attempts to use the framework of the intra

household decision model incorporating parents' uncertainty and expectation to formulate a model that would investigate the determinants of parental decision making process as their uncertainty and expectation is crucial to the investment decision on children's education in the household.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter discusses the methodology employed in the present study. It describes, the study area, study design, population, sampling of respondents, sources and type of data collection and the research instrument used. It also discusses the econometric model, estimation technique, justification of variables, testing of hypotheses and method of data analysis.

Study area

The study area of this research is the Republic of Ghana, which lies on the West Coast of Africa with Cote d'Ivoire to the west and Togo to the east. Ghana is bordered on the south by the Gulf of Guinea and Burkina Faso to the north. It has a total land area of 238,537 square km (Huq, 1989), with 3.5 percent being covered by water.

According to Killick (1978), Ghana's international land boundaries come up to 2,094 km, enveloping the 10 administrative regions of Greater Accra, Volta Region, Eastern Region, Ashanti Region, Brong Ahafo Region, Northern Region, Upper East Region, Upper West Region, Western Region, and the Central Region. Ghana has a tropical climate, which is warm and dry, along the southeast coast; hot and humid in the southwest, and hot and dry in the north.

Ghana has a total projected population of 23.8 million (UNPD, 2009). The 2010 Population and Housing Census bring to five the post-independence

censuses so far conducted, namely that of 2010, 2000, 1984, 1974, and 1960 (Akapule, 2009).

The annual growth rate of Ghana's population is 2.6 percent (UNPD, 2009; GSS, 2000). Ghana's population, according to Ghana Statistical Service Living Standard Survey (2000) report, consists of Black Africans 98.5 percent, with the remaining 1.5 percent being of European and other stock. The major ethnic groups comprise the Akan, 44 percent; Moshi-Dagomba, 16 percent; Ewe, 13 percent; and Ga 8 percent (GLSS 2008).

The major religions include Christianity, 63 percent; Muslim, 16 percent; and African Traditional Religion 21 percent (Oquaye, 2005). English is the official language (Ninsin & Drah, 1987), but the most widely spoken Ghanaian language is Akan, Ewe, Hausa, Nzema and Ga. Killick (1978) posits that although Ghana is an agricultural country, it is also rich in natural resources such as gold, diamond, bauxite, manganese and timber. The main agricultural produce includes cocoa, sheanuts, rubber, coffee, and pineapples.

Ghana's national flag has three equal horizontal stripes, of red, yellow, and green with a fine pointed black star in the centre of the yellow stripe. Ghana was duly granted independence, within the Commonwealth, on 6th March, 1957, thus becoming the first British dependency in sub-Saharan Africa to achieve independence under majority rule. Ghana became a republic on 1st July 1960, with Dr. Kwame Nkrumah as its First President. Ghana has experienced various forms of governance and constitutional arrangements; Ghana was as a sovereign state with a constitution under the British Commonwealth (1957-1960); First Republic

(1960-1966); Second Republic (1969-1972); Third Republic (1979-1981); and the Fourth Republic (1992-present).

Description of the study district settings

The data of parents' expectation and investment in child education were collected from 8 districts in Ghana as shown in Appendix 1A: Sefwi-Wiawso, Mpohor Wassa, Krachi, Ketu North, Dorma Municipal, Sene, Bawku Municipal and Builsa. Table 1 shown below indicate school enrolment, number of schools, number of teachers, pupil per trained teacher ratio and the percentage of repeaters in the various districts selected for the study. Bawku Municipal and Builsa are located in the Upper East region of Ghana. The districts were randomly selected because all the districts in Ghana exhibit similar characteristics in terms of government policies towards education in the country.

According to the Ghana Statistical Service (2000) population census, the total population of the region is about 920,089 but is not evenly distributed across the six districts in the region. The region is the least urbanised in the country. Only 15.7 percent of the population lives in urban areas. Bawku Municipal has levels of urbanization above the regional level and Builsa is entirely rural. The total population of Bawku Municipal 307,917, consisting of 33.5 percent of the region's population and Builsa has a population of 75,375 consisting of 8.2 percent of the population of the region. In the Upper East region, the average household size is 6.4 persons; Bawku Municipal 8.2 person; while Builsa has a relatively low household size of 4.9 persons.

With regard to the age structure in the two districts, about one out of every eight persons is a child below 5 years. The size of each segment has implications for the demand for social services, future population growth. In Bawku East, the ratio of male to female is 47.9 to 52.1 and in Builsa the ratio is 49.1 to 50.9 percent. This means that in the two districts, women out- number men.

With regard to economic activity, the private informal sector, especially agriculture and small-scale industries, is the largest source of employment in the region. The Bawku Municipal and Builsa districts are patrilineal and natural parents play a great role in schooling decisions. In the Ghanaian setting, such as this district, parental motivations for child enrolment in school remain somewhat thin because the opportunity costs for parents to enrol their children in school tend to loom high.

Dorma Municipal and Sene Districts are located in the Brong Ahafo Region of Ghana. According to the 2000 population and housing census, the Region has a total population of 1,815,408, accounting for 9.6 percent of the country's total population. Further from the census of 2000, the Region is the fourth most urbanized in the country. The average household size in the Region is 5.3 persons, with the average household size in Sene and Dorma Municipal districts as 4.8 and 6.0 persons respectively. Also, a third (34.3 percent) of the households is headed by females.

In the Sene and Dorma districts a little over one fifth of the population aged six and older, have never been to school. The proportion of the population that have attained primary (22.3 percent) and middle/JSS (23.3 percent) are

almost the same and only 11.2 percent have attained a level above the middle/JSS. In Sene and Dorma districts, educational enrolment is almost the same for males and females at the pre-school level. In Sene, 1.6 percent of the population is older than six years who and are in pre-school while in the Dorma District, the percentage of the population older than six in pre-school is 2.7 percent.

In terms of occupation, the majority of the workforce of the two districts is in agriculture and related work while the majority of the women engage in retail trade. About three - quarters of the population (74.6%) are self employed with no employees. That is, about 83 percent of the working population in the private informal sector and the proportion in the public sector are low, about 5.1 percent (GLSS, 2000). Sefwi-Wiawso and Wassa West districts are located in the Western Region of Ghana. The region has a population of 1,924,577, constituting about 10 percent of the total population of the country. The population is relatively young, with over 40 percent within the age of 0 and 14 years. The total populations of Sefwi –Wiawso and Wassa West districts are 14,895 and 232,699 respectively.

The region is endowed with considerable natural resources, which give it a significant economic importance within the context of national development. It is the largest producer of cocoa, rubber and coconut, and one of the major producers of oil palm. The rich tropical forest makes it one of the largest producers of raw and sawn timber as well as processed wood products in Ghana. A wide variety of minerals, including gold, bauxite, iron, diamonds and manganese, are either being exploited or are potentially exploitable. The four major occupations in the region

are agriculture, including fishing, animal husbandry and hunting (58.1 percent), production and transport work (14.5 percent); sales work (10.2 percent); and professional and technical work (5.4 percent). The major industrial activities in the region are agriculture, excluding fishing but including forestry and hunting (58.1 percent), mining and quarrying (2.4 percent), manufacturing (10.2 percent) and wholesale and retail trade (10.3 percent). The working population in the private (13.5 percent) and the public (6.0 percent) sectors are mainly employees of private and public sector employers. The levels of unemployment in Sefwi and Wassa West are 9 percent and 5 percent respectively.

The level of literacy in the region is 58.2 percent, with females 47.9 percent recording a lower proportion compared to males 68.0 percent. In this Region, nearly two thirds (64.3 percent) of those currently in school are at the primary level, while 21.3 percent are in junior secondary school. There is, therefore, a very high attribution rate between primary and junior secondary school. In Sefwi Wiawso and Wassa districts, there is a 2.0 percent and 2.6 percent pre-school enrolment respectively.

Ketu North and Krachi districts are located in the Volta Region of Ghana. The Region has a total population of 1,635,421, constituting 8.6 percent of the entire population of the country with majority of its population (73.0%) living in rural areas. The populations of Ketu North and Krachi districts are 237,261 and 159,925 respectively. The Ketu North District, which has little more than one in three (34.8 percent) of the District's population living in urban areas, is also relatively urbanized, mainly as a result of the land port of Aflao.

The main occupation is agriculture, together with related occupations. Slightly higher proportions are in production, transport and equipment operations (13.7%) and in sales work (12.8%). Professional, technical and related workers account for 6.3 percent and Services (3.9 percent). The percentage of Clerical and related workers in the Region is low (2.8 percent); all other groups of workers constitute less than 1.0 percent. Males are mainly in agriculture and related work (61.9%), production, equipment operation and related work (15.5%), and professional and technical work (8.2 percent). On the other hand, females are in agriculture (57.7%) followed by sales (19.2 percent) and production, transport and related work (12.1%). Except in sales work, males predominate in all other occupations. The illiteracy rate in the Region is 41.7 percent and in the Ketu North and the Krachi districts 50.5 and 67 percent respectively. Primary school enrolment in the Ketu North District is 61 percent and in the Krachi District it is 62.9 percent.

Table 1: Literacy level of study areas

Districts	Enrolment	Schools	Teachers	PTTR[3]	Repeaters (%)
Ketu North	15,076	67	277	54	2.9
Dorma Municipal	17,384	92	292	60	2.4
Sene	15,353	83	99	155	0.9
Bawku Municipal	36,769	101	340	108	3.9
Builsa	17,113	78	224	76	11.8
Krachi east	12,636	69	179	71	1.5
Wassa	19,698	111	334	59	2.6
Sefwi- Wiawso	17,141	85	237	72	1.2

Source: The Ministry of Education: Educational Statistics, 2011

[3]Pupil per TrainedTeacher Ratio

From Table 1, school enrolment is 15,076 in the Ketu north district with 67 primary schools. In this district, there are 277 trained teachers with a pupil per trained teacher ratio of 54 and about 2.9 % of the children enrolled in school repeating. In the Dorma Municipal 17,384 are enroled in school with 92 primary schools. In this district, there are 292 trained teachers with a pupil per trained teacher ratio of 60 and about 2.4 % of the children enroled in school repeating.

School enrolments levels in the Sene, Bawku Municipal, Builsa districts are 15,353; 36,769 and 17,113 respectively. With regards to number of schools, Sene had 83 schools, Bawku Municipal 101 and Builsa 78 with trained teachers numbering 99, 340 and 224. The pupil per trained teacher ratio in Sene, Bawku Municipal, and Builsa districts are 155, 108 and 76 with repeater level of 0.9, 3.9 and 11.8 respectively.

From Table 1, school enrolment is 12,636 in the Krachi East with 69 primary schools. In this district, there are 224 trained teachers with a pupil per trained teacher ratio of 76 and about 1.5 % of the children enrolled in school repeating. In the Mphor Wassa 19,698 are enrolled in school with 111 primary schools. In this district, there are 334 trained teachers with a pupil per trained teacher ratio of 59 and about 2.6 % of the children enroled in school repeating.

Finally, from Table 1, in the Sefwi- Wiawso district, there are 17,141 pupils enrolled in school with 85 primary schools in the district. There are 237 trained teachers in this districts giving pupil per trained teacher ratio of 72 with an average of 1.2 % of pupil repeating each year.

Pilot survey

The data collection instruments were pre-tested in the Akatsi district of the Volta Region in 2010. This involved 50 respondents which were covered in 6 days. A reliability test conducted indicated the instruments were reliable given a cronbach's alpha value of 0.76. However, few questions which were ambiguous to the respondents were modified.

Sources of data

In this study, the main sources of data were primary and the unit of analysis was the household. The household survey was conducted from January to March, 2011. The study collected detailed data on households in 16 communities, eight (8) from the southern part and the other eight (8) from the northern part of Ghana. Two communities were selected from each district to make the total of the 16 communities for the study. The 8 districts are Sefwi Wiawso, Wassa West, Krachi, Ketu, Dorma Municipal, Sene, Bawku East and Builsa districts.

In order to obtain detailed information about the decision of the parents on the enrolment of children in schools, household interviews were conducted. For the household interview, the head of the household was selected. Detailed information were collected on household characteristics, such as parents' occupation, educational level of parents, number of spouses, number of children and the family's religion. In addition, schooling history on all the children, both biological and fostered in the household, was collected.

Sample and sampling procedures

The sample refers to that part of the population selected for the study and out of which conclusion will be drawn to reflect the entire population. The sample is necessary because all households in Ghana cannot be covered during the period of this study. In determining the sample size of this study, the following sample procedures were adopted. First, regions in the country were stratified into two main groups, thus the Northern and Southern regions. The Northern sector consisted of Upper West, Upper East, Northern region, Brong Ahafo and Ashanti Region; and the Southern sector, consisted of the Volta, Central, Eastern, Greater Accra and Western Region. This was done to give each region a fair chance of being represented in the study.

After the regions have been stratified, a simple random sampling technique was adopted to select two (2) regions from each stratum making a total of 4 regions selected. And of the selected regions, two districts[4] were selected from each region to make up 8 districts and finally, 2 communities[5] were also selected from each district to make up the total sample for the study. In total, 16 communities were selected and 60 households[6] from each community selected to make the total size.

In order to select the unit of analysis, that is the household, systematic sampling procedures was adopted and the total sample size that were selected for the study was based on the statistical formula specified as:

[4]Districts are second – level administrative subdivisions of Ghana
[5]In this study a community is defined as a group of interacting people, living in some proximity
[6] The concept of household as applied in this study is a group of people living in the same residence and operate under the same budget

$$n = \frac{z^2 pq}{d^2}$$

Where n is the desired sample size, $z =$ the standard normal deviation set at 1.96 $p =$ Enrolment level, $q =$ non-enrolment level, $d =$ the degree of accuracy desired.

$$n = \frac{1.962^2 * 86.9 * 13.9}{10^2} = 43.731$$

Therefore total sample size is specified as:

$$n * 16 = 43.7 * 16 = 699.2$$

In order to take care of missing information, 40% was added to take care of any non respondents in the sample size with this, a total of 960 heads of households were interviewed, 60 from each community. Although we collected data for 960 households, missing values for several variables reduces the number of households in our estimations to 868. This gives a response rate of 90.4% making the data very reliable.

The selection of the households was based on the classification of the Ghana Statistical services classification. Data was collected from household with only two children (boy and girl) of school going ages both attending government school.

The data for the study was collected between January to March, 2011. On the average 6 questionnaires were administered in each of the communities daily. A total of 10 research assistants have be trained and used for the data collection.

Theoretical framework

The basis of the theoretical framework developed in this study takes it roots from the work of Samuelson (1956), Becker (1965) and Thomas (1990) on the theory of time allocation within the neo classical household behaviour model. Thus, the study draws on the assumptions of the unitary model to present a basic theoretical framework of the intra household educational resource allocation model with an underlying assumption of homothetic preferences in household human capital investment decisions. Therefore, this section explains the basic assumptions underlying the theoretical framework of the overlapping- generation model employed in this study. It also explains how estimation of the parents' resource allocation is carried out in Ghana. As a result, expectation about the future is developed as a result of an optimatisation problem. The parent then maximizes his or her inter-temporal utility function, with constraints imposed by his or her income and wealth from work which is spread over his/her child rearing and his/her retirement consumption flows. Finally, the model is specific in econometric form to enable estimation.

Assuming that a representative household lives in two time periods ($t = 1,\ 2$). In the first period, the parents locate his/her income between current consumption c_1 and savings which is invested in children's education. In the second period, the parent income is given by return on their investment which is located for second period consumption c_2. The household is endowed with wealth w and a number of children N of which the household decides on a proportion $(1-\alpha)$ (with $\alpha \in (0,1)$) to educate formally, and a proportion α that should

work to generate income to supplement the household's income for consumption and also to finance the education of the children that the household sends to school. The number of children (N) is assumed to be exogenous, since the emphasis is not on fertility decisions but on human capital investment portfolio decision of children. If parents send their child to school, they are faced with uncertainty about the future employment of the child and remittances given that the child secures a job after school. Because of the uncertainty about investment in the child's education, the parent may decide to diversify its resource portfolio to reduce the risk associated with the investment by keeping a proportion in the house to work. Let the expected utility function of the household be specified as:

$$Eu(c_1, c_2) = u(c_1) + \frac{u(c_2)}{1+\delta} \qquad (1)$$

The utility function of the household is assumed to be concave, such that $u_1^{'} > 0$, $u_2^{'} > 0$, $u_1^{''} < 0$, $u_2^{''} < 0$, $u_{12}^{'} = u_{21}^{'} > 0$. Future utilities are discounted at the rate δ (with $\delta > 0$). The number of children that the household keeps at home αN during the first period generates immediate income. The general functional form of the benefit function is denoted $\mu(\alpha N)$. Conversely, the remaining number of children sent to school is $z = (1-\alpha)N$. For analytical convenience, the benefit obtainable from educating the children is assumed to be linear in the number of children, i.e. θz, where θ is the marginal benefit per child. Furthermore, the parents incur cost in educating their children. Let the cost function be $T(z)$. Note that the cost of educating the child is incurred in the first period but the return to education is only realized in the second period. Since the realization of the return

is probabilistic, it is assumed that some probability (p) is associated with the expected return. The expected net benefit (A) that the parent is likely to derive from investment is specified as:

$$A = \frac{p\theta N(1-\alpha)}{1+r} - T\left((1-\alpha)N\right) \qquad (2)$$

The household faces budget constraints in period 1 and 2 respectively. In addition, it is assumed that the price (q) of the composite good increases at the rate of interest r. The inter-temporal budget constraint is:

$$w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T\left((1-\alpha)N\right) \geq qc_1 + q(1+r)c_2 = q\left(c_1 + (1+r)c_2\right) \qquad (3)$$

The corresponding Langrangian function of the household can be specified as:

$$L(c_1, c_2, \alpha, \lambda) = u(c_1) + \frac{u(c_2)}{1+\delta} + \lambda\left(w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T\left((1-\alpha)N\right) - q\left(c_1 + (1+r)c_2\right)\right) \qquad (3a)$$

Note that λ represents a Langrangian multiplier. In order to determine the optimum values of the various consumptions of the parents and the portion of endowment to invest in the child's education, the first order derivative was taken with respect to present and future consumption and the value of the parental wealth.

$$\frac{\partial L}{\partial c_1} = u_1(.) - \lambda q = 0 \qquad (4)$$

$$\frac{\partial L}{\partial c_2} = 0 \Rightarrow \frac{u_2(.)}{1+\delta} - \lambda q(1+r) = 0 \qquad (5)$$

$$\frac{\partial L}{\partial \alpha} = 0 :\Rightarrow \mu_{\alpha} = \frac{\theta pN}{1+r} - T_{\alpha} \qquad (6)$$

$$\frac{\partial L}{\partial \lambda} = 0 :\Rightarrow w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T\left((1-\alpha)N\right) - q\left(c_1 + (1+r)c_2\right) = 0 \,(7)$$

We divide equation (4) by equation (5)

$$\frac{u_1(.)}{u_2(.)} = \frac{(1+\delta)}{(1+r)} \qquad (8)$$

For analytical convenience, we assume the utility is a log utility function of the form $u(c) = \ln c$. In addition, the following functional forms are assumed: $T(.) = \nu(1-\alpha)N$, and $\mu(\alpha N) = (\alpha N)^2$. Consequently, equation (8) is rewritten as:

$$\frac{c_2}{c_1} = \frac{(1+\delta)}{(1+r)} \Rightarrow c_2 = \frac{(1+\delta)}{(1+r)} c_1 \quad (9)$$

Using the specific functional forms in (7), equation (7) can be specified as

$$w + (\alpha N)^2 + \frac{p\theta N(1-\alpha)}{1+r} - \nu(1-\alpha)N - qc_1\left(\frac{2+r+\delta}{1+\delta}\right) = 0 \,(10)$$

Also, using the functional forms in equation (6), Equation (6) can be specified as

$$2\alpha N^2 = \frac{\theta pN}{1+r} + \nu N \qquad (11)$$

Making α the subject of the relation from equation (11), we have

$$\alpha = \frac{\nu(1+r) - \theta p}{2N(1+r)} \qquad (12)$$

Thus,

$$\alpha = f(\nu, r, N, p, \theta) \qquad (13)$$

The expected sign associated with each variable is specified below

$$\frac{\partial \alpha}{\partial v} = \frac{1}{2N} > 0 \qquad (13a)$$

This indicates that there is a direct correlation between the cost of sending a child to school and the proportion to keep at home. This means that if the cost of sending children to school is high, more children would be kept at home for present consumption.

$$\frac{\partial \alpha}{\partial r} = -\frac{\theta p}{2N(1+r)^2} < 0 \qquad (13b)$$

$$\frac{\partial \alpha}{\partial \theta} = -\frac{p}{2N(1+r)} < 0 \qquad (13c)$$

Also, both the interest and the marginal benefits associated in sending a child to school are inversely related to the proportion of children that would be kept at home. If the return and the marginal benefit associated with sending the child to school are high, the parents would be encouraged to enrol more of their children in school today and the proportion that would be kept at home would be minimal.

$$\frac{\partial \alpha}{\partial N} = \frac{\left(v(1+r) - \theta p\right)}{2(1+r)N^2} > 0 \qquad (13d)$$

The number of children in the household is directly related to the proportion that would be kept at home. In a household with more children, the likelihood of more being kept at home is greater than a household with small number of children.

From equations (10) and (9)

c_1 and c_2 are specified as follows

$$c_1 = \frac{\left((1+r)\left(w+\left(\frac{v(1+r)-\theta p}{2(1+r)}\right)^2 - v\left(1-\left(\frac{v(1+r)-\theta p}{2N(1+r)}\right)\right)N\right) + p\theta N\left(1-\left(\frac{v(1+r)-\theta p}{2N(1+r)}\right)\right)\right)(1+\delta)}{q(1+r)(2+r+\delta)} \tag{14}$$

From equation (14), the real interest rate is assumed to be zero for simplicity and, therefore, (14) becomes

$$c_1 = \left[\frac{w+\left(\frac{v-\theta p}{2}\right)^2 - v\left(1-\left(\frac{v-\theta p}{2N}\right)\right)N + P\theta N\left(1-\left(\frac{V-\theta P}{2N}\right)\right)}{q(2+\delta)}\right](1+\delta) \tag{15}$$

Thus,

$$c_1 = g(w, N, \theta, q, p, v, \delta) \tag{16}$$

And

$$c_2 = \frac{c_1(1+\delta)}{q(2+\delta)} \tag{17}$$

The expected sign associated with each variable is specified below

$$\frac{\partial c_1}{\partial w} = \frac{2+\delta}{q} > 0 \tag{18}$$

The wealth of the parent is directly related to present consumption. In this household, when the wealth of the household is high, they are likely to consume more in the current period.

$$\frac{\partial c_1}{\partial N} = \frac{1}{q(2+\delta)}(1+\delta)\left(\frac{1}{2}Np\theta(-v+p\theta) - \frac{1}{2}Nv(-v+p\theta) + p\theta\left(1-\frac{1}{2}N(v-p\theta)\right) - v\left(1-\frac{1}{2}N(v-p\theta)\right)\right) \gtrless 0 \tag{19}$$

$$\frac{\partial c_1}{\partial \theta} = \frac{(1+\delta)\left(-\frac{1}{2}N^2 pv + \frac{1}{2}N^2 p^2\theta - \frac{1}{2}p(v-p\theta) + Np\left(1-\frac{1}{2}N(V-P\theta)\right)\right)}{q(2+\delta)} >< 0$$

(20)

$$\frac{\partial c_1}{\partial q} = -\frac{(1+\delta)\left(w+\frac{1}{4}(v-p\theta)^2 + Np\theta\left(1-\frac{1}{2}N(v-p\theta)\right) - Nv\left(1-\frac{1}{2}N(v-p\theta)\right)\right)}{q^2(2+\delta)} >< 0$$

(21)

$$\frac{\partial c_1}{\partial p} = \frac{(1+\delta)\left(\frac{1}{2}N^2 p\theta - \frac{1}{2}\theta(v-p\theta) + N\theta\left(1-\frac{1}{2}N(v-p\theta)\right)\right)}{q(2+\delta)} >< 0$$

(22)

$$\frac{\partial c_1}{\partial \delta} = -\frac{(1+\delta)\left(w+\frac{1}{4}(v-p\theta)^2 + Np\theta\left(1-\frac{1}{2}N(v-p\theta)\right) - Nv\left(1-\frac{1}{2}N(v-p\theta)\right)\right)}{q(2+\delta)^2} +$$

$$\frac{w+\frac{1}{4}(v-p\theta)^2 + Np\theta\left(1-\frac{1}{2}N(v-p\theta)\right) - Nv\left(1-\frac{1}{2}N(v-p\theta)\right)}{q(2+\delta)} >< 0$$

(23)

$$\frac{\partial c_2}{\partial \delta} = -\frac{c_1(1+\delta)}{q(2+\delta)^2} + \frac{c_1}{q(2+\delta)} < 0$$

(24)

The discount rate is inversely related to future consumption. This means that when the discount rate of the household is high, less would be consumed in the future.

Estimation techniques

From the apriori expected signs derived from equations (13a, 13b, 13c, 13d), the theoretical model in equation (13) to be estimated is specified as follows:

$$\alpha_i^* = \beta_0 + \beta_1 r_i + \beta_2 v_i + \beta_3 N_i + \beta_4 p_i + \beta_5 \theta_i + \mu_i \qquad (25)$$

Where β_0, is the intercept and $\beta_{i\neq 0}$ are the coefficients of the other explanatory variables. The expected signs for the various coefficients are: $\beta_1, \beta_4, \beta_5 < 0$ This indicates that the proportion of children kept at home are inversely related to these explanatory variables and also $\beta_2, \beta_3 > 0$ indicate a positive relationship among these explanatory variables.

In the estimation of equation (25) the underlying model assumes that (i) the dependent variable is normally distributed (ii) the dependent variable is not correlated with the error term; (iii) there is no omitted variable bias from failure to control for family background and unobserved skills. To address these issues empirically, the Hausman endogeneity test was conducted. The average cost of educating children and the number of children in the household could be endogenous for three reasons. First, as noted by Grilliches (1977), it could result from measurement error. Second, omitted unobservable variable could be positively correlated with both educational expenditure and proportion of children enroled in school leading to overstated number of children enroled in school.

In order to correct for the endogeneity of the average cost of education, and the number of children in the household, the study employed a two-step estimation procedure that involved the use of instrumental variables. In the first-

step, regressed the endogenous variables over instrumental variables to obtain the fitted (estimated) values of endogenous variables.

$$v_i^* = \alpha' X_i + \varepsilon_i \tag{26a}$$

$$N_i^* = \varpi' X_i + \varepsilon_i \tag{26b}$$

Where X_i contains each of the observable model variables, $w, N, \theta, q, p, v, \delta, nS$ and the instrumental variable nS.

$$v_i^* = \sigma_0 + \sigma_1 W_i + \sigma_2 \theta_i + \sigma_3 N_i + \sigma_4 p_i + \sigma_5 nS_i + \varepsilon_i \tag{27a}$$

$$N_i^* = \sigma_0 + \sigma_1 W_i + \sigma_2 \theta_i + \sigma_3 v_i + \sigma_4 p_i + \sigma_5 nS_i + \varepsilon_i \tag{27b}$$

Where ε_i is assumed to be well behaved (i.e. independently and identically distributed) with mean zero and constant variance.

With this procedure, expression (28) is estimated in place of equation (25).

$$\alpha_i^* = \beta_0 + \beta_1 r_i + \beta_2 p_i + \beta_3 \hat{N}_i + \beta_4 \hat{v}_i + \beta_5 \theta_i + \hat{\mu}_i \tag{28}$$

Where $\hat{v}_i$ and $\hat{N}_i$ are the predicted value of the endogenous explanatory variables and $\hat{\mu}$ is the error term that is uncorrelated with $\hat{v}_i$ and $\hat{N}_i$

Table 2: Measurement of variables for model one

Variable	Measurement	Apriori Expectation
Expectations of the child's future job	What is the probability of your children getting the desired job in the future on a five-point bipolar scale: 1= strongly very probable, 0.75=very probable, 0.5= fairly probable,0.25= slightly probable, 0.00 = 'not probable'	+
Benefit Parents Expect to get from children's education	Quote an amount you expected to receive from your child if he/she earns Gh¢ 500 per month.	+
Cost of Education	Amount spent on children's school fees, uniform, extra classes, feeding and others that are related to education.	-
Discount Rate:	Rate at which one will be willing to lend Gh¢ 100 to a friend in the short-run	-
Number of Children	Total number of children of school- going age in the household	-

Section B:

This section discusses the theoretical framework and the estimation techniques that the study adopted to find out based on the sex of the child, and what determines allocation of educational expenditure of children in the household.

Theoretical framework

When modeling the economics of education, one needs to consider the fact that investments in education are generally not made by the primary beneficiaries but by their parents. Thus, there are issues not only of the efficiency of the investment, but also of the intra household allocation of the expected benefits. Preferences, then matters for two distinct reasons. First, learning may contribute directly towards the welfare of the child and of parents, over and above its productive return as an investment. That is, learning may be consumption good. Second, the decision- maker(s)' preference for equity amongst children influences how investment in education are allocated to children with different expected rates of return. The household's decision-making can be represented by a simple model of inter-generational investment in education that illustrates the role of references and rates of return (Hill & King, 1995; Alderman & Gertler, 1997).

Before we proceed to develop the theoretical model for rural Ghana, schooling investments may differ by gender due to the following reason: First, Rates of returns may be gender specific. This explanation is itself rather broad for it encompasses cost and benefit streams of schooling, as well as the process by which inputs are converted into learning. For the rest of this study we will assume

that, conditional on the mix of inputs, both genders perform equally well in school. Still, cost streams may differ when direct costs (such as fees or expenses for uniforms) are gender-specific, when access differs by gender, or when the opportunity cost of a child's time varies by gender. Such cost differences will lead to relatively straightforward differences in rates of investment. These, as well as possible differences in benefit streams.

Secondly, parental empathy, as well as expected transfer from children to their parents, may differ by gender. Differences exist in parental preferences for intra-family equality among sons and between sons and daughters. Alderman and Gertler (1997) use their model to point out that, without further structure, it is difficult to distinguish the implications of differences in returns to schooling investments from disparities in empathy with different children or differences in parents' ability to capture gains achieved by their sons and daughters. They further argue that resource constraints exacerbate the above factors, both due to credit constraints and to patterns of preferences as incomes change. Their model implies that under the same conditions that would lead to higher investments in sons, the demand for daughters' human capital will be more income and price elastic than the demand for sons'. Moreover, their assumptions lead to the conclusion that the difference in the price elasticity falls as family resources rise. The simplicity of this model is useful for illustrating the key point of the similarity of preferences and economic returns for many predictions.

However, as Garg and Morduch (1996) show, whether or not inequality in investments increase or decrease with income may be sensitive to the curvature in

the returns to investments in education. Under their model, which assumes that returns are higher for males and thus provides additional structure, gender discrimination is affected both by the relative rates of the decline of marginal and whether resource constraints are binding so that parents cannot set marginal returns of investments equal to their costs. Moreover, since inequality aversion is important in the model, the composition of siblings also determines schooling choices. At low incomes, due to a greater competition for resources between sons and daughters, a child with all sisters will have higher education investments than one with only brothers. This inequality is predicted to dissipate with income. Thus, Garg and Morduch (1996) also contend that gender discrimination declines with income and that the impact of sibling composition is also affected by income.

Most models of human capital investments have been formulated in terms of a single household utility function. However, mothers may have different preferences for daughters' education than do fathers. Nevertheless, most general models of parental investment in schooling remain instructive under a range of processes of intra household decision making. That is, even if collective approaches account for the process of allocation of household resources, a model formulated in terms of a single decision-maker can still explain why a household member chooses to invest more in one gender than the other.

Now let us consider a household composed of two children, a boy (b) and a girl (g) and γ as the investment made by the parents. For the parents to decide on how much to invest in the education of boy or the girl, it will depend on the

expected utility of returns that is associated with each investment given that the cost of education for a girl and boy is the same. Therefore, the expected utility of returns on education to parents for both boys and the girls is given as:

$$Eu(R) = p_b u(R_b(\gamma; b); \phi) + p_g u(R_g(\gamma; g); \phi) \quad (31)$$

where p_b and p_g are the probabilities of obtaining the respective returns and utility (u) on investing in the boy and the girl, and R is the return on the investment and ϕ is the head of household characteristics. We surmise $uR_b(\gamma, b) \geq uR_g(\gamma, g)$ for all γ; and $p_b < p_g$. However, every investment is associated with a cost and therefore the cost of investing in the children education is given as:

$$C(\gamma) \quad (32)$$

Given the expected utility, returns and the cost of investment, the net expected utility benefit from investing can be specified as:

$$E(N_b) = p_b u(R_b(\gamma; b)) - C(\gamma) \quad (33)$$

$$E(N_g) = p_g u(R_g(\gamma; g)) - C(\gamma) \quad (34)$$

To determine the optimal investment in a boy or girl's education, we differentiated the expected net utility equations (i.e., 33 and 34) with respect to the investment made by the parent as shown below:

$$\frac{\partial E(N_b)}{\partial \gamma} = p_b \frac{\partial u_b}{\partial R_b} \frac{\partial R_b}{\partial \gamma} - \frac{\partial C}{\partial \gamma} = 0 \Rightarrow p_b \frac{\partial u_b}{\partial R_b} \frac{\partial R_b}{\partial \gamma} = \frac{\partial C}{\partial \gamma} \quad (35)$$

From equation (35)

$$P_b = \frac{\partial C}{\partial \gamma} \Big/ \frac{\partial u_b}{\partial R_b}\frac{\partial R_b}{\partial \gamma} \tag{36a}$$

But $\frac{\partial C}{\partial \gamma}$ and $p_b \frac{\partial u_b}{\partial R_B}\frac{\partial R_b}{\partial \gamma}$ is marginal cost and expected marginal utility of investing in a boys education respectively. Therefore, Equation (36) can be re-written as:

$$p_b = MC \Big/ MU(N_b) \tag{36b}$$

From Equation (34), the probability of investing in a girl child is given as:

$$\frac{\partial E(N_g)}{\partial \gamma} = p_g \frac{\partial u_g}{\partial R_g}\frac{\partial R_g}{\partial \gamma} - \frac{\partial C}{\partial \gamma} = 0 \Rightarrow p_g \frac{\partial u_g}{\partial R_g}\frac{\partial R_g}{\partial \gamma} = \frac{\partial C}{\partial \gamma} \tag{37}$$

From equation (37)

$$p_g = \frac{\partial C}{\partial \gamma} \Big/ \frac{\partial u_g}{\partial R_g}\frac{\partial R_g}{\partial \gamma} \tag{38a}$$

$$p_g = MC \Big/ MU(N_g) \tag{38b}$$

In order to determine the impact of changes in the probabilities on the investment decision, we totally differentiate Equations (33) and (34). From both equations, we have

$$\frac{\partial u_i}{\partial R_i}\frac{\partial R_i}{\partial \gamma}\partial p_i + \left[p_i \frac{\partial^2 u_i}{\partial R_i^{\,2}}\frac{\partial^2 R_i}{\partial \gamma^2} - \frac{\partial^2 C}{\partial \gamma^2}\right]\partial\gamma = 0 \text{ , where } i = b, g \tag{39}$$

Let $A_i = \left[p_i \frac{\partial^2 u_i}{\partial R_i^{\,2}}\frac{\partial^2 R_i}{\partial \gamma^2} - \frac{\partial^2 C}{\partial \gamma^2}\right]$<0, since $\frac{\partial u_i}{\partial R_i}\frac{\partial R_i}{\partial \gamma}$>0, $\frac{\partial^2 u_i}{\partial R_i^{\,2}}\frac{\partial^2 R_i}{\partial \gamma^2} \le 0$ and $\frac{\partial^2 C}{\partial \gamma^2} > 0$

Therefore,

$$\frac{\partial p_i}{\partial \gamma} = -\frac{A_i}{\frac{\partial u_i}{\partial R_i}\frac{\partial R_i}{\partial \gamma}} > 0 \tag{40}$$

From Equations (33) and (34), equi-marginal principle requires that the household allocate investment so as to equate the net expected marginal utility, thus,

$$p_b \frac{\partial u_b}{\partial R_b}\frac{\partial R_b}{\partial \gamma} - \frac{\partial C}{\partial \gamma} = p_g \frac{\partial u_g}{\partial R_g}\frac{\partial R_g}{\partial \gamma} - \frac{\partial C}{\partial \gamma} \Leftrightarrow p_b \frac{\partial u_b}{\partial R_b}\frac{\partial R_b}{\partial \gamma} = p_g \frac{\partial u_g}{\partial R_g}\frac{\partial R_g}{\partial \gamma} \tag{41}$$

Therefore, Equation (41) can be re-written as:

$$\frac{p_b}{p_g} = \frac{MU(R_g)MC_g}{MU(R_b)MC_b} \tag{42}$$

This implies that at equilibrium, the portfolio decision of the parent to invest is at a point where the expected marginal utility for both gender is equal. In conclusion, if $\frac{P_b}{P_g} > \frac{MC_g}{MC_b}$, the resource in the household will be invested in the boy's education as against the female counterpart. On the other hand, if $\frac{p_b}{p_g} > \frac{MC_g}{MC_b}$, the investment will be directed to the girl's education.

$$\gamma_j = F\left(p_b, p_g; b, g, \phi\right) \tag{43a}$$

Estimation technique

Equation (43a) which specified the factors that influence head of household educational expenditure allocation is estimated as specified below:

$$\gamma_i^* = \lambda_0 X_i + \varepsilon_i \; i = b, g \tag{43b}$$

Where X is a set of explanatory variables: p_{bi}, p_{gi}, b_i, g_i and p_{bi}, p_{gi}, b_i, g_i represent the probability that the boy would remit in the future, the girl would remit in the future, number of girls and boys in the household respectively.

$$\gamma_i^* = \lambda_0 + \lambda_1 p_{bi} + \lambda_2 p_{gi} + \lambda_3 b_i + \lambda_4 g_i + \lambda_5 \phi_i + \varepsilon_i \qquad (44)$$

Where dummy variable 0 and 1 were used to represent boy and a girl (b and g) in the household.

Table 3: Measurement of variables for model two

Variable	Measurement	Apriori Expectation
Child providing for parents	Probability that the child would provide for you in the future on a five-point bipolar scale: 1= strongly very probable, 0.75=very probable, 0.5= fairly probable, 0.25= slightly probable, 0.00 = 'not probable'(Dummy: male=0, girls =0)	+
child getting future job	What is the probability of your children getting the desired job in the future on a five-point bipolar scale: 1= strongly very probable, 0.75=very probable, 0.5= fairly probable,0.25= slightly probable, 0.00 = 'not probable'(Dummy: male=0, girls =0)	+

Table 3: Cont'd

Religion	Religions affiliation e.g. Christian (1), Muslim (2), traditional (3). etc	-
Educational Level:	Maximum level of schooling	+
Number of Children	Total number of children of school- going age in the household	-
Head occupation:	Main occupation in the current year	+
Family system	Types of family system practice. Generated as dummy, patrilineal =1, matrilineal =0	+ or -
Sex	Either head is a male or female Generated as dummy, male =1, female=0	+ or-
Number of Spouses	Number of spouses	-

Section C

In order to assess whether there exists gender bias in spending on children's education in rural Ghana, the hurdle model was employed as in the work of Kingdon (2005). The hurdle model was considered to the appropriate for this study because as compared to the Ordinary Least Square (OLS) it gives unbiased estimates of the impact of gender bias on educational spending, and

also separates two distinct decisions, which eliminates the assumption that the decisions are made jointly.

The hurdle model is a two-step estimation technique with the first step used to estimate the likelihood of a head of household deciding to spend money on children's education. The second step is an OLS regression of educational spending for the subset of household head that has positive levels of spending, referred to as a conditional OLS. The estimation model can be simply written thus:

$$P(s = 0 / x) = 1 - \kappa(xy)$$

$$Log(s) / (x > 0) \square\ Normal(x\beta, \delta^2)$$

Where s the share of individual spending on education, x is a vector of individual characteristics. The second stage regression is the conditional Ordinary Least Square regression and this is specified as:

$$s_i = \alpha + \beta \ln(\frac{x_i}{n_i}) + y \ln(n_i) + \sum_{j=1}^{J-1} \theta_j \left(\frac{n_{ji}}{n_i} \right) + \eta z_i + \mu_i \qquad (45)$$

where s_i is the share of head of household expenditures on education, x_i is total head of household expenditure, n_i is the number of children in the households, nij is the number of children in the household in age–sex category j, z_i is a vector of head of household characteristics, and μ_i is a stochastic error term, all for head of household i. Head of household characteristics used include the age, years of education, religion and a dummy for sex.

Once both steps of the model are completed, the results are used to calculate the combined marginal effects of the two stages: the impact of each

explanatory variable on education spending overall, incorporating the impact on the decision to spend and the decision about how much to spend. The combined marginal effect (CME) of an explanatory variable x on the share of spending on education s can be written as:

$$\frac{\partial E(s/x)}{\partial x} = \left[\gamma\eta(xy) + \phi(xy)\beta\right]\exp\left(x\beta + \delta^2/2\right) \quad (46)$$

Where $\eta(.)$ is the cumulative normal density function and $\phi(.)$ is the standard normal density function. Estimates of γ, β and δ^2 are obtained from the two stages of the hurdle model. The standard errors of the coefficients and the Combined Marginal Effects (CME) are obtained by bootstrapping.

To make the analysis representative, three equations that divides the country into three parts were estimated, thus for the Southern, Central and Northern Ghana. The regressions were also grouped into two main age groups: 5-9 years and 10-19 years. This was done because the opportunity cost of enroling the two groups in school is different. The opportunity cost involved in enroling a child 5- 9 years in school would be lower than the opportunity cost of enroling a child year 10- 19 years. Children between the ages of 10 and 19 years could work and supplement household income or assist in non market activities unlike those aged between 5-9 years. After estimating the equations, the coefficients were tested to see if there are any significant differences between the three. The adjusted Wald test was obtained to determine the significance of the coefficient of

the variables used in the model. Ramsey's regression specification-error test was also performed on the variables adopted in the model to test the nulll hypothesis of no omitted variables.

Table 4: Measurement of variables for model three

Variable	Measurement	Apriori Expectation
Number of Children	Total number of children of school- going age in the household	**-**
Plot of Land	How many plot of land own by the head; measure in acres	**+ or -**
Educational Level:	Maximum level of schooling. Eg. 0=never attended school, 1=primary not completed, etc	**+**
Marital status	Marital status of the head. 1=single, 2=married, 3=widowed, 4=divorced or separated	**+ or -**
Head income	How much the head of household earn per month	
Age of head	The age of the head of household in current year	**-**
Sex of head	Either head is a male or female Generated as dummy, male =1, female=0	+ or-
Sex of child	Sex of the child. Generated as dummy: male =1, female =0	+ or-

Diagnostic tests

Normality test

To be sure that the variables satisfy the normal distribution assumption, a normality test was performed on each variable, using the Shapiro-Wilk test and the histogram. The variables were transformed to meet the normal distribution condition when it was detected not to be normal after the normality test.

The Jarque-Bera [J-B] normality test

Among all the basic assumptions underlying OLS estimation, normality is assumed to be very critical as the error term (μ) is assumed to be normally distributed with means of zero and a constant variance which is perhaps the first most crucial condition. The Jarque-Bera test statistics determines whether the series follow normal distribution by measuring the difference of the skewness or the measure of asymmetry of the distribution around its mean (S) and Kurtosis which is the indicator for the peakedness or flatness of the distribution of the series (K) with those from the normal distribution. The test statistics is formulated thus:

$$JB = \frac{N-k}{6}\left(S^2 + \frac{1}{4}(K-3)^2\right)$$

where k represents the number of estimated coefficients used to create the series. The J-B statistics follows a Chi-Square distribution (X^2) with two [2] degrees of freedom under the null hypothesis of a normal distribution. The reported probability is the probability that a J-B statistics exceeds, in absolute value, the

observed value under the null, meaning a small probability value leads to the rejection of the hypotheses of a normal distribution. Alternatively, if the histogram is bell-shaped, it is an indication that the residuals are normally distributed.

Multicollinearity

Multicollinearity is a multiple correlation between variables in a model with sufficient magnitude to have the potential to adversely affect regression estimates. In order to ensure that our model is robust to stand the test of time, various diagnostic tests were conducted. The first diagnostic test that was conducted was the multicollinearity test. In this case the hypothesis that was tested at this stage is that the sample of explanatory variables is orthogonal $[r_{xixj} = 1, and, r_{xixj} = 0]$. From these forms, we can easily examine the two extreme cases of orthogonality and of perfect multicollinearity. In case of perfect multicollinearity, the simple correlation coefficients r_{xixj}, r_{xjxi} etc are equal to unity and hence the value of the standardized (correlation) determinant is equal to zero.

In the case of orthogonality of the explanatory variables, the simple correlation coefficient for each pair of the explanatory variable is equal to zero and hence the value of the standardized determinant is equal to unity. The correlation matrix is performed to determine whether or not there is a problem of multicollinearity among the variables.

Ramsey reset test for omitted variables

The Regression Specification Error Test [RESET] as proposed by Ramsey [1969] is based on the classical normal linear regression model of the form $y = X\beta + \varepsilon$ where the disturbance vector ε is presumed to have multivariate normal distribution $N(0, \delta^2)$. The RESET is a universal test for errors such as omitted variables where X does not include all relevant variables in the model; incorrect functional form where some or all the variables in Y and X should be transformed into logs, powers, reciprocals, or indicate some way and the correlation between X and ε, which may be caused by measurement error in X, simultaneous equation considerations combinations of lagged Y values and serially correlated disturbances.

Obviously, under such circumstances, OLS estimator will not be unbiased and consistent. Therefore, the conventional inference procedures will be invalidated. Ramsey (1969) proves that any or all of these specification errors produce a non-zero mean vector for ε. In the light of this, the [H_0] and alternative [H_1] hypothesis of the RESET are:

$H_{0:}$ $\varepsilon - N(0, \delta^2)$, and

H_1: $\varepsilon - N(0, \delta^2)$, $\mu \neq 0$.

The test is based on a regression $y = X\beta + Z\lambda + \varepsilon$. The test for specification error evaluates the restriction $\lambda = 0$. Thus, the crucial problem in constructing the test is to determine what variables should enter the Z matrix may, for example, comprise variables that are excluded in the original specification, so that the test of $\lambda = 0$ is simply the omitted variables test.

In case there is the problem of endogeneity, an Instrumental Variable (IVs) would be introduced to correct for the problem which must satisfy the following conditions:

i. The instrumental variables should be strongly correlated with the suspected independent variables and

ii. The instrumental variables should not be correlated with the error term but because the error term is unobserved, it should therefore not be correlated with the dependent variable. After satisfying these conditions, a reduced form of equation was estimated including IV as one of the explanatory variables and the estimated variable from the reduced form of the model was then substituted into the structured equation.

Heteroscedasticity test

Heteroscedasticity is a violation of one of the requirements of ordinary least squares (OLS) in which the error variance is not constant. The consequences of heteroscedasticity are that the estimated coefficients are unbiased but inefficient. The variances are either too small or too large, leading to Type I or II errors in the presence of heteroscedasticity. OLS is not BLUE (Best Linear Unbiased Estimator). Heteroscedasticity is mainly prevalent in cross-sectional data set such as the one used in this study. Some of the main causes are variance of dependent variables increase or decreases with changes in independent variables, variance of dependent variable increases with increase in the level of

dependent variable and outliers in the data set. Sometimes, a visual check suffices to reveal heteroscedasticity. At other times, though, heteroscedasticity is present but not obvious to the eye, as in cases where there are several explanatory variables in the model. To expose heteroscedasticity when visual inspection is insufficient, the study adopted White test for hetereokesdasticity.

White test for heteroscedasticity

In order to test for heteroscedasticity, we estimated the multiple regression relationship of interest by OLS and compute the OLS residuals, μ^2. Then we regressed the μ^2 against all of the explanators in the OLS model, their squares, the cross products of all the original explanators, and an intercept term. Thus, we estimate

$\mu^2=\beta_0 X_i+v_{ii}$ i=model 1 and 2

Significances of any of the regressors in the above equations would suggest Heteroscedasticity disturbances, as would a high value for R^2. According to White, a large sample of size N, under the null hypothesis of homoscedasticity disturbances, a test statistics equal to NR^2 calculated from OLS estimation, has a distribution with degrees of freedom equal to the number of repressors, excluding the intercept. If this test statistics exceeds the relevant critical value, we conclude that heteroscedasticity is present (Strauss & Thomas, 1995, 1998).

However, if the computed chi-square is greater than critical value, the null hypothesis of homoscedasticity is rejected and we conclude that heteroscedasticity is present.

Correction for heteroscedasticity

Some of the methods used to correct for heteroscedasticity are transformation of data into natural logarithms and the Generalized Least Squares (GLS), also known as the Weighted Least Squares (WLS) and the Robust Standard Errors (RSE). For this study, the robust standard errors method is used because the method has been used in other studies and it has provided satisfactory results and require less assumptions compared to the others. Heteroscedasticity causes standard errors to be biased. OLS assumes that errors are both independent and identically distributed. The robust standard errors relax either or both of those assumptions. Hence, when heteroscedasticity is present, robust standard errors tend to be more trustworthy. As Salibián and Zamar (2002) point out, the use of robust standard errors does not change the coefficient estimates, but (because the standard errors are changed) the t-statistics will give a reasonably accurate p value.

Expected results

In this research, it was expected that as income uncertainty about future income increases, risk adverse parents would tend to diversify their human capital investment in children in order to diversify future income sources. Secondly, it was suspected that the positive portfolio would be remarkably strong for sons and clearly would dominate the possible negative constraint effects as the number of son in the household is not many. Also, it was expected that households with many sons, the negative constraints will dominate.

CHAPTER FOUR

DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Introduction

This section attempts to give a brief description of the background of households involved in the survey. Recall that in the 16 communities, 868 households were sampled. The head of each household was selected for the interview. Information was gathered on the background of the head of household, involving the marital status, number of spouses, religious affiliation, educational level , number of children, income level, expenditure pattern and the risk attitude of the head of the household.

Characteristics of the respondents

Educational level of head of household

The level of education of the heads of each household was expected to play a positive role in determining the proportion of children enroled in school. According to Table 5 column 9 the result shows educational attainment of parents on the national level that 13.1 percent had never attended school, about 11.8 percent attended school but did not complete primary education, 2.7 percent completed primary education, 47.5 completed middle/Junior secondary school, 5.1 percent attended post secondary education but did not complete while only 4.3 percent completed postsecondary education. The results in 2 columns 3, 5 and 7 indicate the educational level of heads of household based on geographical

location. Column 3, 5 and 7 indicate the Northern, Central and the Southern sectors of the country.

From the Northern sector, the result indicated that 15.9 percent had never attended school, about 9.6 percent attended but did not complete primary education, 4.6 percent completed primary education, 44.0 percent completed middle/Junior secondary school , 3.0 percent attended post secondary education but did not complete, while only 5.7 percent completed postsecondary education

In the Central sector of the country, from column 5, the result shows that 9.3 percent had never attended school, about 15.1 percent attended but did not complete primary education, 1.2 percent completed primary education, 46.9 completed middle/Junior secondary school, 6.8 percent attended but did not complete post secondary education while only 6.2 percent completed postsecondary education.

Moreover, the result in column 7 shows the educational attainment of parents from the Southern sector of the country. The result indicates 12.8 percent had never attended school, about 12.1 percent attended but did not complete primary education, 1.6 percent completed primary education, 52.9 percent completed middle/Junior secondary school, 6.3 percent attended post secondary education but did not complete while only 1.2 percent completed postsecondary education.

The result in Table 5 indicates that most head of households on the average had some form of formal education while majority completed at least Middle/Junior secondary school.

Table 5: Educational levels of heads of households

	North		Central		South		National	
Variables	Freq	%	Freq	%	Freq	%	Freq.	%
never attended school	58	15.85	23	9.34	33	12.84	114	13.13
primary not completed	35	9.56	37	15.10	31	12.06	103	11.87
primary completed	17	4.64	3	1.22	4	1.55	24	2.76
middle/JSS not completed	33	9.02	17	6.94	20	7.78	70	8.06
middle/JSS completed	161	43.98	115	46.94	136	52.92	412	47.46
SSS not completed	4	1.09	5	1.04	1	0.39	10	1.15
SSS completed	26	7.10	13	5.31	13	5.06	52	5.99
Voc/Tech school not completed	3	0.82	2	0.82	1	0.39	6	0.69
Voc/Tech completed	4	1.09	1	0.41	1	0.39	6	0.69
Post secondary not completed	7	1.91	14	5.71	13	5.06	34	3.91
Post secondary completed	14	3.83	12	4.89	1	0.39	27	3.11
Tertiary not completed	1	0.27	1	0.41	2	0.78	4	0.46
Tertiary completed	3	0.82	2	0.82	1	0.39	6	0.69
Total	**366**	**100**	**257**	**100**	**245**	**100**	**868**	**100**

Source: Field survey, 2011

Barro and Lee (1996) argue that there are several channels through which the level of education might influence the individual. Bronchi (2003), explained the impact of educational attainment, on individual decision-making. Education

would enhance critical thinking, which in turn increases one's desire to invest in it.

Marital status

On the other hand, marital status may exert a strong influence on a head of household decision to enrol children in school. The present study, therefore, considered the marital status of the respondents, as one of the socio-demographic characteristics studied. The result is presented in Table 6. Column 3, 5, 7 and 9 show the results from the Northern, Central, Southern sectors and the country as a whole.

Table 6: Marital status of heads of household

	North		Central		South		Combined	
Marital Status	Freq	%	Freq	%	Freq	%	Freq	%
Married with spouse	253	69.12	195	79.59	187	72.76	635	73.15
Married with spouse migrated	34	9.28	21	8.57	16	6.22	71	8.17
Widowed	30	8.19	8	3.26	21	8.17	59	6.79
Divorced or separated	49	13.38	21	8.57	33	12.84	103	11.86
Total	**366**	**100**	**245**	**100**	**257**	**100**	**868**	**100**

Source: Field survey, 2011

In addition, information on the marital status of the heads of the households was collected and out of the 868 respondents, about 73.2 percent were currently married, with their spouses living with them; 8.17 percent were married

but with their spouses living elsewhere; 6.8 percent were widowed; and 11.9 percent were divorced or separated from their spouses.

From the Northern sector, column 3, about 69.1 percent were currently married, with their spouses living with them; 9.28 percent were married but with their spouses living outside; 8.1 percent were widowed; and 13.4 percent were divorced or separated from their spouses. In the Central sector, Column 5, about 79.6 percent were currently married, with their spouses living with them; 8.6 percent were married but with their spouses living elsewhere; 3.3 percent were widowed; and 8.7 percent were divorced or separated from their spouses. Further, in the Southern part of the country about 72.8 percent were currently married, with their spouses living with them; 6.2 percent were married but with their spouses living elsewhere; 8.2 percent were widowed; and 12.8 percent were divorced or separated from their spouses.

From Table 6, it can be observed that most respondents were or had been in a union of one form or the other before. In effect, therefore, one is able to infer from Table 6 that most of the respondents on the average were married with their spouses living with them. This might have a good effect on the head as he is likely to get support from the partner in terms of finance and ideas for decision-making (Patton, 1993).This trend of marital status was revealed in the GLSS 5 report (2008).

Sex of heads of households

Information on the sex of the heads of the households reveals that out of the 868 heads of households, 686 (representing, 79.0 percent) were males and 182 (20.97 percent) were females.

Table 7: Age group by sex of respondents

Age	Male	Percent	Female	Percent	Total	Percent
<35	275	40.09	87	47.80	362	41.71
36-50	318	46.36	75	41.21	393	45.28
51-65	77	11.22	16	8.79	93	10.71
>66	16	2.33	4	2.20	20	2.30
Total	**686**	**100**	**182**	**100**	**868**	**100**

Source: Field Survey, 2011

As shown in Table 7, about 40.1 percent of respondents in the age below 35 were males while females in the same age group constituted 47.80 percent. The age group 66 years and above had the lowest number for both males (2.3 percent) and females (2.20 percent). Generally, the majority of the respondents fell into the young adult and economically active age group from 36 to 50, representing 46.4 percent and 42.21 percent for female. The mean age of the respondent is about 37 years for both males and females.

Ethnicity of heads of households

On the ethnicity of heads of the households on aggregate level, (Table 8, column 9) the survey results indicated that the households interviewed belong to the Akan ethnic group (39.4 percent), Mole Dange 34.1 percent, Ewe 16.2

percent, while Ga Adangme and others constitute 6.3 percent and 3.22. Non - Ghanaians constituted 0.34 percent.

On geographical basis, column 3 reveal 4.1 percent for Akan, 74.0 percent for Mole Dange, 14.2 percent for Ewe, 1.6 percent for Ga-Adangme, 5.5 percent and 0.5 percent for other and non Ghanaian respectively. Also, column 5 from the Central sector revel 69.7, 5.7,23.4,10.2,0.8 and 0 percent for Akan, Mole Dange, Ewe, Ga Adangme, other and Non-Ghanaians respectively. Finally, in the Southern sector about 61.8 percent were Akans; 4.3 percent were Mole Dange; 21 percent were Ewe; 9.3 percent were Ga-Dangme; 2.3 percent others and 0.38 percent were Non-Ghanaian. This distribution is reflected in the GLSS 5(2008) report which stated that about 53 percent of the total populations in Ghana being Akans.

Table 8: Ethnicity of head of household

	North		Central		South		National	
	Freq	%	Freq	%	Freq	%	Freq.	%
Akan	15	4.09	171	69.7	159	61.86	345	39.74
Mole Dange	271	74.0	14	5.71	11	4.28	296	34.10
Ewe	52	14.2	33	13.4	56	21.78	141	16.24
Ga-Dangme	6	1.63	25	10.2	24	9.33	55	6.33
Other(Ghanaian)	20	5.46	2	0.81	6	2.33	28	3.22
Non-Ghanaian	2	0.54	0	0	1	0.38	3	0.34
Total	**366**	**100**	**245**	**100**	**257**	**100**	**868**	**100**

Source: Field Survey, 2011

Religion of heads of households

Table 9 depicts the various types of religious denominations to which the heads of households belong. In the country as a whole, as shown in column 9, most of the respondents were Christians, representing about 49.5 percent; 43.3 percent were Muslims; 6.7 percent are traditionalists; and just a few 0.46 percent belong to other religions.

Table 9: Religion of heads of households

	North		Central		South		National	
	Freq	%	Freq	%	Freq	%	Freq.	%
Christian	69	18.52	182	74.29	179	69.65	430	49.54
Muslim	274	74.86	51	20.82	51	19.84	376	43.32
Traditional	21	5.74	11	4.89	26	10.12	58	6.68
Other	2	0.55	1	0.41	1	0.39	4	0.46
Total	**366**	**100**	**245**	**100**	**257**	**100**	**868**	**100**

Source: Field Survey, 2011

The result in Table 9 column 3, 5 and 7 shows the religious affiliation of the head of household based on geographical location. Column 3 (North) reveals 18.5 percent were Christian; 74.9 percent Muslim; 5.7 percent Traditionalist and 0.6 percent belongs to other religious. From the Central sector, shown in column 5, shows 74.3 percent Christians, 20.8 percent Muslim, 4.8 percent traditionalist and 0.41 percent represent the others. In addition, column 7 (Southern sector) reveals 69.7 percent for Christians, 19.8 percent for Muslim, 10.1 percent for traditionalist and 0.39 percent for other religious affiliations.

Number of spouses of the heads

Number of spouses of the heads of household in terms of number of spouses of the household, Table 10 column 9 below has revealed that the majority (71.8 percent) are married to a single spouse whiles 4.3 percent are single, separated or divorced but have children with their former spouse; and 23.7 percent had married between two to six spouses. In the Northern sector in column 3, shows 60.9 percent are married to a single spouse whiles 2.7 percent are single, separated or divorced but have children with their former spouse; and 15.9 percent had married between two to six spouses. Also, the result from the Central part reveals 82.0 percent are married to a single spouse whiles 4.5 percent are single, separated or divorced but have children with their former spouse; and 13.1 percent had married between two to six spouses. With regard to the southern section, the result in column 7 reveals 77.4 percent are married to a single spouse whiles 6.2 percent are single, separated or divorced but have children with their former spouse; and 16.4 percent had married between two to six spouses. The result reveals that on the average each household has 1 spouse. The result also confirms the belief of polygamous home in Ghana where men are allowed to marry more than one wife.

Table 10: Number of Spouses of Heads of Households

	North		Central		South		National	
	Freq	%	Freq	%	Freq	%	Freq.	%
0	10	2.73	11	4.49	16	6.22	37	4.26
1	223	60.92	201	82.04	199	77.43	623	71.77
2	89	2.73	17	6.94	26	10.11	132	15.2
3	36	9.84	9	3.67	11	4.28	56	6.45
4	5	2.73	4	1.63	4	1.56	13	1.5
5	2	0.55	2	0.81	1	0.39	5	0.58
6	1	2.73	1	0.41	0	0	2	0.23
Total	**366**	**100**	**245**	**100**	**257**	**100**	**868**	**100**
Mean	0.99			1.06			1.340	

Source: Field Survey, 2011.

In conclusion, it can be seen that the demographic characteristics of the various head of household exhibit similar patterns in the various geographical location in the country.

CHAPTER FIVE

DETERMINANTS OF PARENTAL INVESTMENT IN CHILD EDUCATION

Introduction

This chapter presents and discusses the results related to the factors that influence parents' decision to invest in their children's education. Respondents were asked to give details of the factors they considered when deciding to invest in their child's education. After collecting data and taking out the missing information, the final sample size obtained for the analysis was 868 respondents. The endogeneity problem was identified and IV/2SLS regression was employed. J-B normality test was conducted on the model and the results were also discussed.

Determinants of investment in education in Ghana

Various studies (Barro 2001; Behrman & Knowles 1999; Beneito et al., 2001) on determinants of demand for education conclude that the average cost of education, the number of children in the household, the occupations of the heads of the households and the availability of schools in the community and the number of siblings in the household are the main factors that influence parents to invest in their children's education from the explicit factors considered to determine investment in child education, there are also implicit factors that influence parents in Ghana such as the following: the expected probability that the child gets a job in future, and the expected benefit and the discount rate of the head of the household. This information is presented in the Table 11.

Table 11: Summary statistics of the main determinants of investment in child formal education

	A				B				C				D			
	$\bar{x}$	S. D	Min	Max	$\bar{x}$	S. D	Min	Max	$\bar{x}$	S. D	Min	Max	$\bar{x}$	S. D.	Min	Max
Av. explicit cost (GH¢)	97	1.8	0	345	108	6.9	15	567	98	11.	78	445	121	22.58	0	567
Prob. child will get job (%)	0.75	0.3	0	1	0.8	0.2	0	1	0.8	0.3	0	1	0.77	0.29	0	1
Expected monthly Benefit (GH¢)	76	0.9	0	200	77	8.0	50	133	82	3.3	100	1000	299	55.62	0	1000
Discount rate of parents (%)	36	5.6	10	150	37	5.3	0	130	33	8.9	0	145	35.4	69.10	0	150
Number of children	3.12	1.1	1	10	1.1	0.6	1	6	3.1	1.1	1	9	2.99	1.01	1	10

Field Survey, 2011; A-North; B-Central; C-South and D- National level

Table 11 column D shows the result at the national level. From the table, the average explicit cost of enroling children in school, is about GH¢ 121 per term during 2009/2010 academic year. This means that parents spent about GH¢ 121 a term on enroling their children in school in Ghana. This cost of education could include school fees, Parent Teacher Association (PTA) levy, cost of uniform, books, transportation to and from school, and feeding at school and extra classes. To reduce the cost of education to parents in enroling their children in school, government instituted various programmes such as Capitation Grant, School Feeding Programme and distribution of school uniforms to some selected schools in the country. The introduction of these programmes seems to reduce such costs as feeding cost, school fees and in some cases cost of school uniforms. However, the upsurge of paying for extra classes in recent times put more burdens on the parents and this is one of the major factors contributing to the high cost of educating children in Ghana. In addition, Parent Teacher Associations also impose a lot of levies on parents to pay in order to improve on conditions in the various schools. All these lead to an increase in cost of investing in children's education in Ghana and these costs are high, especially in the rural areas where the majority of the population live below the poverty line (GSS, 2000).

The result in Table 11, columns A, B and C representing northern, central and the southern sector respectively show similar trends to that of the finding of the national level. This means that on the average, the location of the parents does not bring much difference in the average cost of educating a child. This can be explained from the fact that in Ghana, the educational policies are uniformly

implemented across the country, so policies such as free education, Capitation Grant, Free Uniform and others are implemented in all the regions of Ghana, hence giving a picture of similar cost pattern in the country.

On the issue of the number of children owned by the head of the household, the minimum number of children is one (1) and the maximum being ten (10) on the national level. This is the number of children aged between 5 and 19 in the household. The mean number of children by the respondents interviewed is 3. This implies that on the average each head of a household that was interviewed have 3 children as shown in Table 11 column 14 above.

On geographical basis, the maximum number of children in the northern households is 10 and minimum of 1 given that in each household in the northern sector there are on the average 3 children. Columns 8 and 9 reveal a maximum of 6 and minimum of 1 given each household an average of 1 child as shown in column 6. Finally, in the southern sector as shown in column 4, the maximum number of children in the household is 9 with a minimum of 1 given an average of 3 children shown in column 10. This reveals that households in the northern and the southern sectors of the country tend to have more children than households in the central part of the country. This result confirmed the 1998 demographic health survey data that reports total fertility ranges from 3.0 to 4.55 in Ghana and this confirms the average number of children in the household to be around 3. The 2000 population census estimated the population growth rate of the country to be 2.7 per cent and on average each woman has 3 children.

The results from Table 11 column D indicate that at the national level, the average perceived probability of parents in Ghana whose children would get the desired job they want is about 77 percent. Thus, if the probability is high, more parents will be encouraged to invest in their children's education. In the northern sector, the perceived probability that the child would get the desired job after school is 0.75 percent, in the central sector 0.8 percent and in the southern sector 0.8 percent. These results are shown in columns A, B and C in Table 11. This behaviour of parents can be explained by the Keynesian theory of speculative behaviour where high expectations encourage people to undertake investment. According to this theory, when an individual expects to benefit from future investment, he/ she being rational will forgo present consumption and invest in the current year to enjoy the benefits in the future leading to increase investment in children education and vice versa.

When parents make decisions to invest in child education, they also consider the benefits they will derive from this investment after the child has completed school and started working. From Table 11 column D, the average benefit from child education is about GH¢ 299. The result in Table 11 column A, B and C show the average expected benefit of sending a child to school. Column A (North) reveals 97 Ghana cedis; 108 Ghana cedis for the central part and 98 Ghana cedis. This figure represents on average the amount of money a head of the household expects to receive monthly from their children after investing in their education in rural Ghana. This implies that when the benefit is below GH¢ 299, parents would prefer to keep their children out of school to work to supplement

their present consumption. On the other hand, if the benefit of sending a child to school is equal or greater than GH¢ 299, parents will prefer to enrol their children in school today to derive the maximum benefits in the future.

As shown in Table 11, in Ghana, the average discount rate of parents is about 35 percent per annum. That is, on average, the rate of time preference for parents in Ghana is low, and this implies that most heads of households in Ghana are willing to invest more in their children's education. The result reveals that location tends not to have a great influence of time preference for parents as the result shown in column A, B, C and D show very similar patterns.

Correlation matrix

Table 12 presents the correlation matrix of leverages and explanatory variables. Most cross-correlation terms for the independent variables are generally low, thus giving little cause for concern about the problem of multicollinearity among the independent variables used for the analysis of the study. The results show that the expected marginal benefit and the expected probability that the child would get job after school and the discount rate are positively and significantly related to the proportion of children parents' enroled in school in Ghana. However, the number of children in the household, average cost of enroling children in school is negatively related to the proportion of children enroled in school by Ghanaian parents.

Table 12: Correlation matrix

	child enrol	Marg ben	Av cost	Disc rate	Prob job	Num of child
child enrol	1					
Marg benefit	0.3968	1				
	(0.000)					
Av cost	-0.2738	0.0927	1			
	(0.000)	(0.000)				
Disc rate	0.0331	0.0206	-0.1384	1		
	(0.413)	(0.477)	(0.000)			
Prob job	0.7029	0.2605	0.4269	-0.0531	1	
	(0.000)	(0.000)	(0.000)	(0.062)		
Num of child	-0.0973	0.2746	-0.295	0.095	-0.373	1
	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	

Probability values in parentheses

This implies that, the higher the expected marginal benefits by parent, the higher parents will be willing to enrol their children in school. Also, the probability that the child would get a job in the future is directly related to the proportion of children sent to school. The result indicates that if the expected

probability that the child will get a job in the future is higher, more investments will be done in children. Discount rate of the parent is considered to be negatively related to the number of children enroled in school. This means that if the discount rate of the parent is low, the parent will invest more in child education. However, the result in Table 12 above indicates a positive relationship, implying that a high discount rate is associated with a high school enrolment. The explanation is that parents may not only consider the physical reward in taking decision on child investment but other socioeconomic factors may lead to this relationship.

Normality test

For the results to be reliable, the dependent variable used for the regression must be normally distributed. To satisfy this condition, a normality test was, therefore, performed on the dependent variable. In addition, this test was conducted on other explanatory variables and those found not to be normally distributed were transformed to be normally distributed around the mean. The test results and the transformed results are shown in Appendix A.

In addition, the J-B normality test was conducted on each of the residuals (R_s) in each of the equations (25, 28 and 44) to determine the statistical distribution of the variables and this result is shown in Appendix B. A careful examination of the J-B t-statistics and probabilities, skewness and excess kurtosis show that all the residuals, associated with the four (4) equations follow a normal distribution. This is because the distribution of these variables conforms to

conditions of normality, namely a skewness of zero (0) with excess kurtosis of three (3) approximately. Besides, the non-significance of the probability values shows that there are no serious problems of normality at the conventional levels. There is, therefore, ample evidence that the error terms are normally distributed around their respective means, so that each of the estimated error term (ε_i) is distributed normally as $\varepsilon_i - N(0, \delta^2)$.

Proportion of children enroled in schools

In this section proportion of children enroled in school as enumerated in the study is analysed as a function of a set of explanatory variables which include the number of children in the household, the perceived probability of child getting the desired job in the future, the utility discount of the parent (measure as the parents time preference), the benefit from child education, the average expenditure on children education and the number of children in the household. Table 13 provides the results of two-stage least squares estimation which indicate that on average about 55 percent of the total variation in the model has been explained by the explanatory variables. This implies that key factors that are considered to explain the proportion of children sent to school in Ghana are captured by the model and must be considered when formulating policies on school enrolment of children in Ghana.

Given that in Ghana the decision process is solely by the household head, there are variables which could be endogenous to the system. Accordingly, potentially endogenous variables were tested. The average expenditure on

children education and the number of children in the household were identified as endogenous. Instrumental variables were selected according to the criteria specified in (Bound et al. 1995). The number of spouses of the head of the households and the age of the head were used as a proxy for the average expenditure on children education and the number of children in the household. The Sargan test shows that IV-2SLS estimation was properly identified and the instrument were significant at the 5 percent and 10 percent level while the partial adjusted R-squared of the first stage regression was of reasonable magnitude thus 65 and 73 percent. On account of the data set, one is thus able to instrument for the endogenous variables to a good level. A further detail of the first stage regressions is provided in Appendix C, and the test conducted in choosing an Instrumental variable (IV) is shown in Appendix D. The result of the reduced-form regression is shown in Appendix E. Ramsey RESET test (Ramsey, 1969) was also conducted to test for omitted variables in the model and this result is shown in Appendix F. In addition, Wald Test was also conducted to determine the significance of the coefficient of the variables used in model and based on the t-statistics some variables have been dropped. The result of the Wald test is shown in Appendix G.

The regression results in Table 13 show the second stage regression results on the main factors that influence parents' decision to invest in their children's education. In order to see whether there is any geographical influence on parents' decision, the country was divided into Northern, Central and the Southern sectors. The northern sector represents Upper East, the Central sector Brong Ahafo and

finally, the Southern sector comprises Volta and Western regions. In Table 13, columns 2, 3 and 4 shows the results of Northern, Central and Southern parts of Ghana while column 5 shows the national level results for Ghana. The results in Column 5 revealed that the location of the head of household does play a significant role in determining parents' decision to send their children to school, as the coefficient of location (Central and the Southern sector) is statistically significant.

The result presented in Table 13 indicates that location of parents in Ghana does play a role in the parents' decision to invest in their children's education. Parents who live in the central and southern parts of the country enrol most of their children in schools than households in the Northern sector of the country. It can be explained that heads of households in the Northern sector may not have enough resources to enrol their children in schools as compared to parents in the Southern part of the country. In addition, the most important factors found to influence parents' decision to enrol children in school in Ghana include: the benefits from child education, the discount rate of heads of households, the average cost of education, the probability that the child will get the desired job after school and the number of children in households.

Table 13: IV-2SLS result of proportion of children enroled in school

Dependent variable: Log of children in school

Variables	North	Central	Southern	National level
Benefit from child	0.194**	0.041*	0.1689***	0.026***
Education	(0.187)	(0.345)	(0.187)	(0.173)
Est. average cost of	0.026***	0.028*	0.387***	0.0508**
educating a child	(0.611)	(1.732)	(0.0.611)	(0.035)
Head of household	0.041***	0.039***	0.027***	0.150***
Discount rate	(1.37)**	(2.703)***	(0.019)***	(0.194)***
Prob. child will get	0.006*	0.207*	0.0679**	0.0047*
desired job	(0.032)	(0.001)	(0.360)	(0.972)
Est. Num of children	-4.57*	-3.081**	-0.187**	-0.690**
	(0.391)	(0.049)	(0.088)	(0.031)
Central Ghana				1.311***
				(0.128)
Southern Ghana				2.071*
				(0.899)
Constant	-0.065*	2.31*	-1.08	3.072**
	(2.06)	(0.33)	(0.291)	(0.065)
Observations	366	245	257	868
Adj.R-squared	0.418	0.456	0.473	0.548

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Field Survey, 2011; Base category: Location (northern)

At the national level, the regression result in Table 13 column 4, indicate the discount rate is significant at 1 percent and positively related to explaining the proportion of children that parents decide to enrol in school. At the sectoral level, the same pattern is revealed as shown in column 2, 3 and 4. This means that generally in rural Ghana, as the discount rate of the head of household increases, more children are enroled in school and parents with lower discount rates enrol few children in school. This result is in contrast to the studies of Lang and Ruud (1986) and Anderson (2009), where they concluded that there is an inverse relationship between the present consumption and investment. This positive relationship can be explained from the point that parents in Ghana consider children as both investment goods and consumption goods and in this study reveals that the consumption aspect is so strong that it outweighs the investment good. This means that parents derive a psychological benefit when they invest in their children's education. For example, the society may respect parents who invest in their children's education. That is, having children in school may give parents some societal recognition and prestige. Based on this societal prestige that is associated with investing in children's education, parents may not only consider the investment aspect but rather the prestige enjoyed in the society. In addition, parents may invest in their children's education not because they are expecting a return that would benefit them but they consider it as a responsibility. Parents then invest more in their children's education despite the high discount rate and this is consistent with Becker (1965) and Yueh (2001), who concluded that culture and societal influence affect parents' decision on human capital investment. In

conclusion, the study found out that parents in Ghana invest in their children's education, mainly not for the physical benefit but due to the psychological and social benefits associated with investing in child education.

The result in Table 13 indicate that at both the regional and the national levels, the total number of children in a household is inversely related to the proportion of children enroled in school. This implies that when the number of children in a household is large, only a small proportion would be enroled in school. The results presented in Table 13 column 2, 3, 4 and 5 show the expected sign, and this is highly significant at 10, 5, 5 and 5 percent respectively. This means that the null hypothesis that the number of children does not influence parents' decision in enroling children in school is rejected. This is because when the number of children in the household is large, the head spends lots on household expenditure. This situation leaves the head of the household with limited income to spend on children education. This situation leads to resource constraint in investing in children's formal education. This situation can been seen in the result in Table 13 column 5, where one can conclude that an increase in the total number of children in the household by 10 percent will reduce school enrolment by approximately 7 percent. Beneito et al. (2001) and Becker (1981) concluded from their studies that the number of children in the household is negatively related to the number enroled in schools and this is consistent with the findings of the present.

The probability of children getting the desired job in the future, in explaining parents' decision to invest in children's education is significant at 10

percent at the national level as shown in column 5 and also at 5 percent level of significance at the southern sector of the country. This is in rejection of the null hypothesis that the probability of the child getting the desired job does not influence parents' decision to invest in the children's education. Thus, the higher the parents perceive that their children will get the desired job in future, the higher would be the investment in their education and the lower the perceived probability that the child will not get the desired job in the future after school, the lower the investment in the child's education. As in the works of Booth et al, (2007), Foltz and Gajigo (2007), Bennel (1996), education is considered an investment and parents invest in their children's education if the benefits exceed the cost. This implies that if parents expect their children to get the desired employment, after school, and they would benefit from it, then more parents would enrol their children in school. However, the result from this study, as shown in Table 13 above, also indicate that, the higher the perceived probability, the higher parents in Ghana would invest in their children's education but the magnitude of the response is very small, and vice versa. This means that generally, investment in education is considered to be associated with some level of risk. Also, the amount of resources that parents invest in their children's human capital also depends on whether parents fear risk or love risk.

Risk-averse parents are uncertain about the future rate of return to human capital. Thus, the amount of investment in human capital would be smaller. This means that majority of parents in Ghana are risk-adverse and for them to minimize the risk associated with investment in their children's education, they

need to diversify their portfolio to spread the risk associated with investment in their children's education in Ghana. Hartog et al. (2002) study on linking measured risk aversion to individual characteristics concluded that investment in education is associated with risk; and in order to minimize the risk, there must be portfolio diversification. Razin's (1972) study on investment in human capital concludes that due to the risks associated with investment in education, the amount of resources parents will invest in their children's education will depend on whether they fear or love risk. In other words, expectations alone do not play a role in parents' decision making process but rather on whether the parent is either risk adverse or risk lover. But in Ghana, most parents are risk adverse and tend to diversify their portfolio in investment. In conclusion, if the perceived probability that the child would secure a job after school increases by 100 percent, only approximately additional 0.5 percent of school going age children will be enroled in schools in rural Ghana.

The result presented in Table 13 indicates that the benefit from child education has a positive relationship with the proportion of children enroled in school and is significant at 1, 1, 10 and 5 percent for the national, southern, central and the northern sectors respectively. The null hypothesis that benefits from children's education do not influence the decision of the number of children parents enrol in school is rejected at 1, 1, 10 and 5 percent of significance. This means that the benefit from child education plays a significant role in determining the number of children that are enroled in schools in Ghana. This positive relationship between the benefit and the number of children enroled in school is

confirmed in the work of Booth et al. (2007), Foltz and Gajigo (2007), Bennel (1996) and Psacharopoulos (1994, 1972). Also, Keeny et al (1979) found out in his study that the contribution of farm children has decreased; implying that parents tend to increase the number of hours their children spend in school and this is as a result of the benefits parents expect to derive in the future. At the national level, the result reveals that, if the benefits from children's education increase by 100 percent, the number of children enroled in school would increase by 3 percent.

This study considered only the explicit cost such as school fees, cost of uniforms, feeding cost, Parent Teacher Association dues, cost of extra classes and transportation cost incurred in enroling a child in school. It is expected that the average cost of education and the number of children parents enrol in school are inversely related. This is because schooling of children involves a lot of expenditure in terms of the payment of school fees, supplemental fees and other costs like feeding cost and cost of educational materials. It is, therefore, plausible that if the average cost of enroling children in school is high parents will turn to enrol few children in school. Pritchett and Filmer (1999), measuring investment in education in the United States and examining the determinants of school completion in 35 countries, concluded that the average cost of education is inversely related to the number of children enroled in school. This means that when the average cost of education is high we expect fewer children to be enroled in school. However, the regression result showed in Table 13 at both the regional and the national level indicates a positive relationship between the average cost of

education and the number of children enroled in school. Investment in education by parents is associated with some utility level. Therefore, due to the level of satisfaction and prestige that parents in Ghana derive from seeding their child to school, even though the cost associated with investing in children's education is increasing, more children are being enroled in school. This is supported by evidence in the Ghana Statistical Service Living Standard Survey (2008) report. At the national level the result also indicated that when the average cost of education increases by 10 percent, school enrolment would increase by a small margin of about 0.5 percent. That is, the investment decision by parents in Ghana regarding investing in their children's education is more complex than just looking at the explicit cost.

Finally, the results in Table 13 reveal significantly positive coefficients for location variables in explaining the proportion of children parents will enrol in school in Ghana. The Central sector is significant at 1 percent while the Southern sector is also significant at 10 percent. The result indicates that parents in the central and southern parts of Ghana will enrol more children in school than parents in the northern Ghana. This is because in the northern sector, availability of land discourages parents to send their children to school. Parents in this part of the country prefer to use their children for their farming activities than seeing them in school. In addition, the underdevelopment of the northern sector forces parents to use their children for market activities to generate income to supplement the household income. The GLSS 2000 report also indicated that there are fewer schools in the northern sector compared to the central and the

southern part of the country. This situation implies that, children in that region have to walk long distances to school. This situation often discourages parents to also enrol their children in school. This lower school enrolment in the northern sector is consistent with the GLSS report of lower school enrolment in the north compared with central and southern Ghana.

B. Determinants of parents' investment in girls' and boys' education

As the objective of this section is to find out the factors that influence parents' decision on the proportion of children to enrol in school in Ghana, this section also looks at the factors that determine the proportion of boys and girls enroled in school in Ghana. The Wald test was conducted to determine the joint significance of the coefficients of the model across gender and sector and the result is shown in Appendix H. Table 14 (columns 2 and 3) represents the results for boys and girls in the north. The results from column 2 indicate that 33 percent of total variation in the model has been explained by the explanatory variables. This means that the factors that determine the proportion of boys to be enroled by parents in the northern sector are relevant. On the other hand, results from column 3, indicate that 23 percent of the total variations in the model has been explained by the explanatory variables. At the central and the southern sector, for boys 30 and 29 percent of the variables included in the model explain the variation. Also, with regard to girls in the central and the southern sector, 29 and 34 percent of the variation is explained. At the national level, on the average 28 percent and 26 percent of the variation in the model are explained. This situation indicates that

the factors that are considered to determine school enrolment of girls must be looked at critically when making decisions on girl child - education.

Table 14: Determinants of investment in girls and boys education

	North		Central		South	National		
Dependent Variable	Log of girls in school	Log of boys in school	Log of girls in school	Log of boys in school	Log of girls in school	Log of boys in school	Log of girls in school	Log of boys in school
Benefit from educ	0.036*	0.079**	0.029*	0.038*	0.399**	0.084***	0.0557**	0.0556***
	(0.002)	(0.027)	(0.227)	(0.026)	(0.010)	(0.026)	(0.0242)	(0.00843)
Est. av. cost of	-0.079*	1.968	2.038	0.529	0.353***	2.139	0.0335**	0.00538
education	(0.259)	(0.055)	(0.527)	(0.296)	(0.014)	(0.151)	(0.0159)	(0.00615)
Discount rate of	0.001			1.417			-0.0235	
parents	(0.004)			(0.166)			(0.0160)	
Child will get job	2.072**	0.127**	0.041*	6.48**	0.205***	0.344	0.460***	0.124***
	(0.142)	(0.045)	(0.017)	(0.527)	(0.008)	(0.009)	(0.111)	(0.0567)
Est. Num children	-2.496*	-1.146*	-6.260***	2.157*	0.410***	0.0024**	0.132***	0.0720***
	(0.141)	(0.006)	(0.438)	(0.085)	(0.011)	(0.015)	(0.0156)	(0.00491)

Table 14: Cont'd

Central Ghana							0.0217	0.00199
							(0.0353)	(0.0150)
Southern Ghana							0.0283*	0.0426
							(0.108)	(4.725)
Patrilineal system	1.101**	0.026**		3.81**	0.003***	0.022***	0.169**	0.0832***
	(0.054)	(0.004)		(6.071)	(0.012)	(0.087)	(0.0508)	(0.0189)
Male head	0.037*	3.067*	0.267**	2.031*	0.0029**	3.042***	-0.0230**	0.225***
	(0.251)	(0.022)	(0.031)	(0.096)	(0.015)	(1.004)	(0.0448)	(0.0169)
Constant	3.731**	5.451*	2.292***	0.912*	0.026**	0.0632*	0.301**	0.703***
	(0.054)	(1.32)	(0.965)	(0.004)	(0.432)	(0.042)	(0.116)	(0.0449)
Observations	53	131	91	223	152	218	296	572
Adj. R-squared	0.33	0.226	0.291	0.301	0.341	0.29	0.275	0.260

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Field Survey, 2011; Base categories: 1. Location (northern); 2. Sex of household head (Female)

The results presented in Table 14 on regional and the national level shows the same pattern. At the national level as shown in column 8 and 9 indicates that the benefits from both boys' and girls' education have a positive relationship with the proportion of both girls and boys enroled in school and these are significant at 5 percent and 1 percent respectively. The null hypothesis that the benefit from girls' and boys' education does not influence the decision of the number of girls and boys parents enrol in school is rejected at 5 percent and 1 percent level of significance respectively. This implies that the benefit from the education of both boys and girls plays a significant role in determining the number of children parents' enroled in school. This implies that if parents expect in the future to benefit from the investment they made in their children's education, more is enroled in school. However, if the expectation of parents about the future benefits from their children's education is low, less will be enroled in school. This positive relationship is confirmed in the work of Booth et al. (2007) and Foltz and Gajigo (2007), Bennel (1996), Psacharopoulos (1994, 1972). This study reveals that in rural Ghana both at the regional and the national level, the expected benefit of the parents play an important role in the number of both boys and girls enroled in school.

At the national level, the results from Table 14 column 8 indicates that the average cost of educating a girl child is significant at 5 percent and negatively related to the proportion of girls enroled in school. Also, in the northern sector the average cost of educating a girl child is statistically significant at 10 percent and negatively related to the number of girl child enroled in school. This means that

when the average cost of education increases, the number of girls enroled in school decreases. However, the average cost of educating boys is not statistically significant across region and the country in explaining the proportion of boys enroled in school, although parents tend to value investment in the education of boys rather than that of the girl - child. Parents tend to be particular about the cost involved in the education of the girl child as they look at the benefit-side in rather investing in the boy - child's education. This also could imply that parents tend to be particular with the cost when they want to invest in their girl-child's education in general but seem to be less bothered about the cost associated with their boys' education. This finding is consistent with Cortez (2001) and Lam and Duryea (1999) who concluded that the cost of education is one of the major determinants of the education of girls.

Table 14 further shows that the probability of both girls and boys getting the desired jobs in the future are both significant at 1 percent level of significance and positively related to the number of boys and girls enroled in schools at the national level. On regional basis these factors are also statistically significant at various levels and positively related to the number of girls and boys enroled in school, this is shown in column 2 to 7. This means that if the expectation of parents is that of a high probability of their children obtaining the desired jobs in future, then more girls and boys in the household will be enroled in school. This is because investment in children's education is a form of security for Ghanaian parents. Therefore, if there is a high expectation of the children getting job in the future, it implies parents are secured for the future. This believes encourages

parents to enrol both boys and girls in school. The finding in this study is consistent with the work of Booth et al. (2007), Foltz and Gajigo (2007) and Bennel (1996), who concluded that parents' expectation about employment of their children influences their decision to invest in their education.

At the national level, the northern and central part of the country, the total number of children in households is inversely related to the proportion of both girls and boys enroled in school. This implies that, when the number of children in the household is large, only a small proportion of both boys and girls would be enroled in school. The results presented in Table 14 columns 2, 3,4,5,8 and 9 show the expected sign, and this is statistically significant at 10, 10, 1, 1 and 1 percent respectively. This means that the null hypothesis that the number of children does not influence the number of both boys and girls to enrol in schools is rejected. From Table 14 columns 8 and 9, one can conclude that an increase by 100 percent in the total number of children in the household will reduce school enrolment for boys by 13 percent and for girls by 7 percent. This study reveals that as the number of children in the household increases, other expenditures also increases living little for educational expenditure. This situation determines the number of both boys and girls enroled in school. This finding is in line with the findings of Beneito et al. (2001) and Becker (1981) who agree that the number of children in households is negatively related to the number of children, enroled in schools. However, on regional basis, the result in Table 14 columns 5, 6 and 7 reveal the opposite. It shows that the number of children in the household is statistically significant at 10, 1 and 5 percent but positively related to the number

of children enroled in school. This means that at this place, increase in the number of children in the household will see more children in school. This can be deduced from the fact that in the southern and central parts of the country, due to the activities of the colonial masters, there are lots of educational institutions available and parents in this part of the country do understand the importance of child education. This therefore compels them to enrol more children in school. Also, there seems to be many job opportunities in this part of the country compared to the other parts, therefore with parents expectations about future job of their children, the number of children in the household do not really matter in their decision making process. Lastly, most parents in this sector tend to be government workers and this grants them the opportunity to access financial assistance from most financial institution making them less liquidity constrained to enrol their children in school.

In considering the school enrolment of girls and boys in the households, the type of family system was also considered. These systems are the patrilineal and the matrilineal systems practised in different parts of the country. The results from Table 14 indicate that the patrilineal family system compared to matrilineal system was significant in explaining school enrolment decision of parents for both boys and girls. As shown in Table 14 this is significant at 5 percent for girls and 1 percent for boys and also positively related to the proportion of both girls and boys enroled in school. This means that, in a system, where inheritance favours boys' i.e. patrilineal system, few girls are enroled in schools in Ghana.

At both regional and national levels, the result shows significant coefficients for the sex of the head of the household in explaining the proportion of boys and girls enroled in school. At the national level, this is significant and negative at 5 percent for the girls and, 1 percent but positive for boys' school enrolment. This implies that a female headed household, influences more girls to be enroled in school as compared to the boys; On the other hand, if the head of a household is a male then more boys are enroled in schools compared to the girls. This result conforms to the findings of Pasqua (2005) who found that female heads of a household prefer more investment in girl-child education while male-headed households also prefer more investment in boys' education.

Finally from Table 14, the results indicate that the location of the heads of the households does not influence the number of boys enroled in school. However, this is significant at 10 percent in explaining the number of girls enroled in school. The positive coefficient shows that the heads of households in the southern part of Ghana would enrol more girls in school than those in the northern part of Ghana. This may be due to differences in cultural beliefs. Another reason that may account for this situation is the fact that in the northern sector as found in the GLSS 2000 report; there is a higher level of poverty as compared to the southern part of Ghana. This finding is also confirmed in the GLSS 2000 report where majority of girls are migrating to the south for greener pastures, indicating a low school enrolment for girls at the northern part of the country (GSS, 2008). In summary from Table 14 indicate that benefits from education, the average cost of education, the number of children in the household,

and the location are the major determinants of the proportion of both girls and boys enroled in school.

Conclusion

This chapter discussed the main determinants of investment in education in rural Ghana at both national and regional levels, and the factors that determine the proportion of children enroled in school in households in Ghana. The main factors found to determine investment in education by heads of households in Ghana are: average cost of education, the sex of the head of the household, the type of family system, the probability of the child getting the desired job after school, the benefit from investment in education, the discount rate of the head of the household and the number of children in the household.

The sex of the head, type of family system practised and location of the household thus invariably plays a very important role in parents' decision on investment in the child's education. Parents with high expectations of benefits from education tend to invest more in their children's education. Parents' expectations of a child getting the desired jobs in the future after school also influenced their decision. Finally, the study revealed that the proportion of children parents invest in, in terms of education, is also influenced by the psychological benefits and social status that the individuals acquire in the community.

CHAPTER SIX

INVESTMENT IN SCHOOLING

Introduction

The objective of this chapter is to investigate the occurrence of bias in spending on children in the household based on sex. The chapter therefore analyses the share of educational spending on children in Ghana. In order to understand and effectively analyse the situation; the analysis is done in terms of gender and age groupings of children in the household. This is because the opportunity cost of parents spending on children aged between 10-19 years to enrol in school is greater than the opportunity cost of enroling children of the aged 5-9 years. The Hurdle model was employed in this study. The results showed that parents in Ghana preferred to invest more in their boys' education than in the girl - child education.

Allocation of educational expenditure within the household

In order to derive a robust result from the regression result, multicollinearity test was conducted on the variables to avoid high R^2 and insignificant coefficient. The test result of the multicollinearity is shown in Appendix I. All the result indicates Variance Inflation Factor (VIF) of less than 3. This indicates that there is no problem of multicollinearity with the variables included in the model. The results in Table 15 present the main determinants of expenditure on children's education. The main determinants of resource allocation on children's education are, the probability that the child will provide for the

parents in the future, the age of the household heads, heads of the household's religion, heads of household's educational level, occupations of the heads of the households, number of children in the household, type of family system and the sex of the child. The model presented below indicates that on average; 36 percent of the variations in the model have been explained by the explanatory variables included in the model. The result in Table 15 indicates that the geographical location of the heads of the household does not play any role in determining allocation of resources on children's education in Ghana.

Table 15: Determinants of educational expenditure within the Household

Dependent variable: Log of educational expenditure

Variables	North	Central	South	National
Male provide in future	4.44**	8.03.4***	0.03.90***	0.004***
	(0.56)	(3.06)	(0.709)	(0.171)
Male child get job in future	0.09**	5.310*	1.808**	0.019***
	(0.04)	(23.26)	(12.04)	(0.003)
Age of household head	0.14*	0059	0.736	0.062*
	(0.14)	(1.200)	(0.646)	(0.403)
Christian	0.36***	0.009***	0.610	196.8***
	(0.13)	(1.096)	(15.03)	(33.38)

Table 15: Cont'd

Muslim	2.24***	0.1686***		0.008***
	(0.050)	(8.709)		(0.80)
Traditional	0.67***	171.0***	3.613	0.11***
	(0.57)	(4.107)	(0.14)	(1.11)
Primary	0.348*	10.43	0.1430	0.228
	(0.39)	(23.97)	(24.25)	(12.11)
Junior/Middle	1.266*	0.75.99*	1.003***	0.017***
	(1.00)	(4.36)	(2.80)	(0.95)
Secondary	0.34**	0.27	0.33*	0.10.2***
	(1.12)	(0.88)	(1.14)	(1.11)
Post Secondary	0.014**	0.184***	0.011***	2.154***
	(0.001)	(0.025)	(0.077)	(0.188)
Tertiary	6.23***	0.10*	0.12***	0.62***
	(0.59)	(0.04)	(0.06)	(0.50)
Self -employed	0.60***	1.52***	0.84	0.55***
	(0.71)	(1.39)	(1.17)	(0.95)
Government worker	2.98**	0.030***	0.255	0.67**
	(0.14)	(0.14)	(3.78)	(0.03)
Student	-0.97	4.35*	6.58	10.16
	(0.18)	(5.09)	(0.77)	(4.01)
Retired	2.15	1.17**	25.90	-0.096
	(0.49)	(6.44)	(1.31)	(5.97)

Table 15: Cont'd

Number of spouses	-3.23**	0.09	-0.25	-0.062*
	(0.430)	(0.003)	(1..71)	(0.401)
Central Ghana				00.81
				(0.001)
Southern Ghana				-0.921
				(0.070)
Patrilineal system			0.300	0.199
			(1.03)	(10.008)
Male head of household	9.56***	11.63	1.47	5.81***
	(10.25)	(6.38)	(0.004)	(2.70)
Constant	-0.064***	2.3***	-0.55**	-2.01***
	(0.56)	(0.014)	(0.33)	(4.41)
Observations	366	245	257	868
Adj.R-squared	0.423	0.392	0.333	0.362

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Survey Data, 2011; Base categories: 1. Location (northern); 2. Sex of children (Female); 3. Education (No education); 4. Family system (matrilineal)

The results in Table 15 indicate that the perceived probability of the parents that the child will provide for them in the future is highly statistically significant at 1 percent, implying that this factor plays a very important role in parents' decision regarding how much on the average to invest in their children's education. The result shows a positive relationship and it indicates that the

probability that a boy-child would provide for the parents in future is greater than the girl child. This finding is consistent with Pasqua (2005) and Alderman and Gertler (1997), who found out that parents tend to prefer spending on the boy - child's education than on the girl child's education. The GLSS5 report of the GSS (2008), on the school enrolment also shows that more boys are enroled in schools than girls; and this also goes to confirm the findings of this study that in Ghana parents prefer spending on their children's education and that this preference is in favour of the boy - child's education.

In addition, expectation of parents that their children will get a job in the future is significant in making a decision on the education of children in Ghana. Fortin and Lemieux (1998), Coverman (1983) and Barnes and Jones (1974), in their studies on the job market, conclude that there is discrimination against female and this influences parents in determining how much to invest in their children's education. Parents in Ghana considered investment in children's education as security for their future. Therefore, due to the poor implementation of the labour laws, generally, there exists labour market discrimination against females. This is because most employers consider females to be less productive than their male counterparts. Explanation to this behaviour from employers stem from the fact that female employee will be requesting maternity leaves in addition to their normal leaves. Also, most female may not be willing to work overtime should the need arise. This is because, they will prefer to close at the normal time and see to their children and husbands. Further, some occupations require a lot of travelling and manual work which are suitable for males than females. However,

in the Ghanaian setting, the woman has to seek permission from the husband before she can travel and the husband is likely to refuse. This situation compels the employers to discriminate against women in the job market. This discrimination discourages parents to allocate more resource to their girl child education. Also, parents may also discriminate against their female children in the sense of uncertainty. Parents are sometimes scared that the female child may become pregnant and drop out of school. When this situation arises, parents then consider their investment to be a waste. With this notion that the female may get pregnant and drop out of school, parents prefer to allocate more resource to their male children than the female children. In conclusion parents perceived that male children secure the desired jobs in the future and therefore, spend more on their education as compared to their spending on the girl education.

Further, Table 15 shows that the religious affiliation of the head of the household matters in determining how much expenditure the head of the household spends on children's education. Table 15 indicates a 1 percent level of significance for all the religion categories (thus Christian, Muslim or Traditional). The positive coefficient of religion also indicates that parents who belong to the Christian, Muslim and the Traditional religions spend more on their children's education as compared to parents who belong to other religions such as Hinduism. Sacerdote and Glaeser (2001) in the study of education and religion in the United States concluded that there exists a positive relationship between education and religion as religious attendance is considered as a major form of social interaction. This confirms the fact that the religion of the head of the household determines

how much should be spent on the education of children in the household.

Table 15 indicates that the educational level of parents play a significant role in determining the average expenditure that parents make on their children's education. From Table 15, the results indicate that parents or heads of households who completed Junior Secondary School, Senior Secondary School, Post Senior Secondary School and tertiary education were statistically significant at 1 percent level and therefore influenced the expenditure of parents on children's education. It can be observed from Table 15 that, the coefficient of the educational level variables are positive, thus indicating that parents with formal education tend to spend more on their children's education than parents with no formal education. This is because as parents acquire more education, they tend to know the importance of education and more importantly the importance of the girl child education. Most educated parents in Ghana, tend to believe that educating a female leads to an improvement in the health of the family and above all good home management. This understanding of the benefit of girl child education encourages parents with higher education to spend more on the girl child. In addition, educated parents considered both the implicit and explicit benefits of investing in their children's education. As parents acquire more education, they tend to release the implicit benefit associated to girl child education. For example sending their daughter to school gives them some psychological satisfaction compared to parents with low level of education. Kirchsteiger and Sebald (2010) found that parents' preference in spending on children's education is determined by their parents' educational level. Pasqua (2005) studied gender bias in parental

investment and found out that, the educational level reached by parents plays an important role in their decision on how much to spend on their children's education, especially with respect to the sex of the children. Thus, this study has confirmed that Ghanaian parents' educational level determines the average expenditure made on a child's education.

The results from Table 15 indicate that one of the major factors that determine the average expenditure on education by the head of the household is the head's occupation. The results indicate that the self employed and parents in government employments are statistically significant at 1 percent and 5 percent respectively. These variables are also positively related to the share of educational expenditure. This means that parents in employment in either private or government sector tend to spend more on their children's education as compared to heads of households who are unemployed. This can be explained from the point that these categories of heads of households earn higher income and therefore, spend more on child - education than those who are unemployed. In Ghana generally, government workers and private sector workers seem to have regular income, and they are more likely to spend more on their children's education, and therefore know the importance of spending on children's education regardless of sex. Also, most financial institutions give financial assistance to workers in protected employment as compared to self employed. Therefore, the financial constraint faced by heads in spending on their children's education is less with those in protected work. This situation leads to the relations observed in the Ghanaian settings. This finding is consistent with Glick and Sahn (2000) and

Marshall and Swift (1999) who in their studies concluded that occupation of the parents is one of the main factors that influence the number of children enroled in school and its accompanying expenditure on them.

The number of spouses of the head of the household has a negative effect with the average expenditure on education. This is due to the fact that, as the head of household has more spouses, their general expenditure level increases and this makes it very difficult for them to also spend much on their children's education. At 10 percent level, the number of spouses is statistically significant in explaining the average expenditure of the head of the household on education. Donkoh and Amikuzuno (2011), in their study of the determinants of the household education expenditure in Ghana, concluded that the number of people in the household determines the household expenditure and this goes to confirm the finding that the number of spouses which add up to the number of people in a household determines the average expenditure on education by the head of the household.

The results from Table 15 show, in terms of location that it is only in the northern part of the country that the sex of the head of the household plays a significant role in explaining the expenditure parents make on children's education. It indicates that at 5 percent level of significance, male heads of households spend more on children's education than in households with female heads. In general, the sex of the head of the household is significant at 10 percent in explaining the expenditure on child-education. The results show that the heads of households who are males spend more on children's education than the female heads and this confirms the findings of Hoddinott and Haddad (1995).

Gender bias in educational spending

This section discusses the objective of gender bias in educational spending in households in Ghana. Separate regressions for northern, central and southern households were estimated, after testing whether the coefficients are significantly different between the three equations. Using the adjusted Wald test, the null hypothesis that the coefficients for northern, central and southern households were not different from each other was rejected at the 1% confidence level. The result of the Wald test is shown in Appendix J. Table 16, 17 and 18 shows the results of the determinants of the share of heads of household's expenditure on education in the northern, central and southern sector respectively. The factors found to influence the decision to and how much to spend on education in the Ghanaian household are: Number of children in the household, sex of the head of household, head of household's income, age of head of household, years of schooling of the household head and number of plots owned by the head of the family. The regression results presented in Table 16, 17 and 18 indicate Adjusted R-squared of 33 percent, 31 percent and 53 percent respectively for the 5 to 9 years age category. This implies that on the average 39 percent of the variations in the models has been explained by the explanatory variables included in the model. With the 10 to 19 year category, the Adjusted R-squared associated to the northern, central and southern are; 33, 30 and 53 percent respectively. This also implies that on the average 39 percent of variation in the model is explained.

Table 16: Share of head of household expenditure on education in northern Ghana

	Ages 5-9 years			Ages 10-19 years		
Variables	Probit	OLS	CME	Probit	OLS	CME
Num children	-0.207***	-0.014**	-0.205*	-0.831**	-0.280*	0.813*
household	(1.116)	(0.161)	(0.031)	(0.081)	(0.024)	(0.030)
Male	-0.014	-0.641*	-0.022	-0.082	-7.142**	-0.020
	(0.013)	(0.660)	(0.029)	(0.007)	(0.090)	(0.470)
Head	0.033*	0.002***	0.051	0.501*	0.029***	0.033
Income	(1.14)	(0.011)	(0.1.08)	(0.003)	(0.022)	(0.233)
Head of	0.005*	0.009	0.026*	0.013*	0.010	0.011**
household age	(0.019)	(0.023)	(0.028)	(0.099)	(0.022)	(0.082)
Years educ.	4.478	0.302	0.103	-0.089	0.203	-0.061
of head	(0.003)	(0.353)	(0.091)	(0.236)	(0.77)	(0.011)
Constant	3.231	0.101**	0.237	0.010	1.316**	0.019
	(0.33)	(0.027)	(0.162)	(0.054)	(1.114)	(0.030)
Observations	201	201	201	165	165	165
Adj. R-squared		0.331			0.329	

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Survey Data, 2011

Table 17: Share of Head of household expenditure on education in central Ghana

	Ages 5-9 years			Ages 10-19 years		
Variables	Probit	OLS	CME	Probit	OLS	CME
Num child	-0.141***	-0.254**	-0.570	0.147**	-0.025*	0.393**
household	(0.57)	(0.009)	(0.267)	(0.099)	(0.540)	(0.781)
Male	-0.025	-0.141	-0.267	-0.108	-0.061	-0.009
	(0.187)	(0.082)	(0.140)	(0.240)	(0.019)	(0.060)
Head house-	0.111	0.321**	0.540	0.114	0.033	0.176
hold Income	(0.106)	(0.002)	(0.220)	(0.374)	(0.177)	(0.115)
Head of house	0.226**	0465	0781*	0.026*	0.006	0.064
hold age	(0.019)	(0.077)	(0.120)	(0.019)	(0.311)	(0.276)
Years educ.	0.204	-0.129	0.010	-0.101	-0.431	-0.276
of head	(0.59)	(0.277)	(0.093)	(0.191)	(0.331)	(0.194)
Constant	-0.133	2.094**	-4.521	0.351	3.66**	1.351
	(0.141)	(0.012)	(0.670)	(0.501)	(0.226)	(0.089)
Observations	155	155	155	99	99	99
Adj.R-squared		0.310			0.302	

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Survey Data, 2011

Table 18: Share of Head of household expenditure on education in southern Ghana

	Ages 5-9 years			Ages 10-19 years		
Variables	Probit	OLS	CME	Probit	OLS	CME
Num children in	-0.094*	0.232	0.358	-0.115*	-0.252	0.287
Household	(0.029)	(0.164)	(0.085)	(0.066)	(0.262)	(0.144)
Male	-0.001	-0.025	-0.255	-0.005	-0.041	-0.045
	(0.284)	(0.004)	(0.08)	(0.015)	(0.072)	(0.136)
Head household	0.013**	0.009***	0.267***	0.176**	0.022***	0.077***
Income	(0.019)	(0.027)	(0.110)	(0.025)	(0.085)	(0.029)
Head of house-	-0.0048	0.073	-0.027	-0.096	0.051	-0.099
hold age	(0.044)	(0.024)	(0.189)	(0.033)	(0.051)	(0.071)
Years education	-0.006	0.179	-0.393*	-0.017	0.255	-0.140*
of head	(0.021)	(0.188)	(0.071)	(0.183)	(0.073)	(0.032)
Constant	2.33***	3.091	2.74***	0.934**	5.358	2.891***
	(0.433)	(1.237)	(0.465)	(0.426)	(1.220)	(0.004)
Observations	128	128	128	129	129	129
Adj. R-squared		0.533			0.531	

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Survey Data, 2011

The Probit, OLS and CME in Table 16, 17 and 18 indicates the decision to spend, the amount spent and any differences in expenditure in the household respectively. The results in the tables indicate that the decision of the heads of households to spend on their children's education is influenced by the number of

children in the household. They are negatively related and statistically significant at 10 percent, 10 percent and 1 percent level for all the age categories in the Northern, Central and Southern Ghana respectively. This indicates that for the head of the household to take decision to spend on children's education, the number of children in the household play a critical role in this decision process. The inverse relationship between the decision to spend and the number of children in the household can be explained from the point that the more children in the household, the more consumption expenditure. This explains therefore that, for the head of the household to maintain balance in the household expenditure, he/she needs to consider the decision to spend on education of children critically. This result is in conformity with the works of Anderson (2009), Glick and Sahn (2000) and Greene (1993) on the study of determinants of school enrolment of children concluded that the number of siblings in the household play a critical role.

The results from Tables 16, 17 and 18 further indicate the amount to spend on the number of children in the household is statistically significant for Northern and Central but insignificant in the southern part of the country for the two age categories. This means that the actual amount that parents will spend on their children's education will depend on their location. According to the GLSS 4 report, majority of people living in the northern and the central part of Ghana live below the poverty line as compared to the southern part of Ghana. This may explain why parents in that region seriously consider the number of children in

the household when making decision on the amount to spend on children's education.

In addition, the availability of job opportunities in the Southern sector as compared to the other two sectors may play a significant role. As parents consider education as an investment, availability of job opportunities in the South may make them not to consider the number of children in the household. But if job opportunities are limited as in the north and the central parts, parents then consider the number of children when making investment decisions on education. This result is in conformity with Manson and Khandker (1997), who in the study of gender bias in education, concluded that the location of the parents does influence their decision on investment in children's education.

Further, Tables 16 and 17 show that the income of the head of the household determines the decision to spend and how much to spend on children's education for the two age categories. Table 16 and 17 also indicate that the income of the head of household is on the average 1 percent and 10 percent level of significance in explaining the decision to and the amount to spend on children. The positive coefficient of income of the head of the household also indicates that parents with higher income are more likely to invest and also spend more on their children's education. This is to say that, in Ghana, the rich are more likely to spend more on their children's education than the poor. This may also be due to the fact that the rich have less credit constraints than the poor. This positive correlation between parents' income and spending on children's education is also confirmed in the findings of Edmond (2006), Ersado (2005), Basu (1998) and

Schultz (1993), that economic well-being of the parents have a positive relationship with school enrolment.

However, the result in Table 18 for the two age categories reveals that the decision to spend do not depend on parents income as this is not statistically significant. This means that in the Central part of the country, parents' decision to spend on their children's education is not likely to be influenced by their income levels. This can be explained from the point that parents in this region really understand the importance of investing in their children's education, therefore as to the amount to invest, it is not likely to be influenced by their income. This reasoning is confirmed by the GLSS 4 report that indicate that school enrolment in the Central sector of the country has improved greatly as compared to other regions in the country.

From the regression result in Table 16 and 17, the age of the head of the household is statistically significant. In Table 16, the result shows 1 percent and 5 percent for 5 to 9 year and 10 to 19 year age categories. In Table 17, it is significant at 5 percent and 1 percent level. The age of the head in the northern and the central part of the country is positively related to explaining the decision to spend and the amount to spend on children's education. This means that as the age of the head of household increases, more is likely to be spent on children's education. The positive relationship can be explained from the point that parents in Ghana consider investment in education as a guide for old age and as they age, they invest more in their children's education as they believe this will enhance their children's future and for them to have better remittance. However, the

opposite pattern holds for the result in Table 18 which represents the Southern sector of Ghana. The result indicates age of parents is not statistically significant in explaining parents' decision to spend and the amount to spend on children's education. The negative relationship shown in Table 18 indicates that parents in the Southern sector of the country tend to invest less in children's education as they grow. This can mean that generally, parents in the South are risk adverse and will like to diversify their portfolio to reduce risk at old age. This they do by rather investing in other physical capital which they consider to be less risky than investment in children's education. To conclude, the risk nature of parents play a critical role in this respect as evidenced in the work of Hartog et al (2002) and Razin (1972) who studied parents decision to invest in relation to their risk level.

On the issue of the share of household expenditure that goes to education by region and gender, the result in Table 19 indicate that, in the Central and Northern part of Ghana the amount of resources that heads of households devote to their male children's education is greater than their female counterpart. This result is consistent with the GLSS 4 report which indicates more male school enrolment to less female school enrolment in the northern and the central part of the country. This difference in education share expenditure may also be attributed to differences in cultural beliefs. Cultural practices in this part of the country consider male children to be more important to parents at old age than female children as they assume the responsibility of taking care of them at old age. The female is thought to get married and be responsible to the husband. This confirms the findings of) Pitt et al. (1990), Thomas (1990) and Rosenzweig and Schultz

(1982) in their studies on gender differences in resource allocation within the household.

Table 19: Shares of household expenditure going to education by region and gender

	Without boys		With boys		
Region	Mean	Linear std. Err	Mean	Linear std. err	t value
Northern	0.042	0.007	0.054	0.016	2.923***
Central	0.096	0.114	0.11	0.001	5.836**
Southern	0.102	0.057	0.035	0.022	-0.0569

*** p<0.01, ** p<0.05, * p<0.1

Source: Survey Data, 2011

Finally, there exits gender bias in the household share of education spending requires that the marginal effect for each age category be significantly different for the two sexes. Result in Table 20 shows the differences in marginal effect (marginal effect of the share of boys minus the marginal effect of the share of girls) on education spending for the decision to spend (Probit), the amount spent (Conditional OLS) and the combined marginal effect (CME). Based on the F statistics result, the null hypothesis has been rejected that the effects were equivalent in all age categories in the three localities except on the decision to spend for the aged group 10-19 years in the Northern sector.

Table 20: Differences in marginal effects

	Northern			Central			Southern		
Variables	Probit	OLS	CME	Probit	OLS	CME	Probit	OLS	CME
Share of children 0-9	-0.180***	-0.316**	-0.180*	-0.164**	-0.280*	-0.164*	6.87**	9.33***	3.765**
Share of children 10-19	-0.128	-1.067*	-0.128**	-0.166	-1.16**	-0.166	5.67***	8.41**	6.081*
F / R^2	2.524	0.476		1.869	0.667		3.563	0.577	
N	201	165	165	155	99	99	128	129	129

Source: Survey Data, 2011

The result in Table 20 indicates that in all the three sectors in Ghana (Northern, Central and Southern) the marginal effect of female shares were lower. From the result, the combined marginal effect was negative for each age category. However, the opposite pattern holds in the Southern sector of the country where the decision to spend for children aged between 0-9 and 10-19 years is large.

The share of females aged 0-9 and 10-19 has a greater impact on the decision to spend, the conditional amount spent and combined marginal impact than the share of boys. This indicates a strong evidence of objective gender bias in education spending at household levels in rural Ghana. The result indicates the bias is pro-female in the Southern sector and pro - male in the Central and the Northern sector of the country. Therefore, to conclude, we can say that there is gender bias in share of education spending in households in rural Ghana. This result confirms the studies of Masterson (2011), Thomas (1994), Behrman (1997) and Haddad et al. (1997), on studies on gender bias in investment in children's education.

Conclusion

This chapter investigated the share and the determinants of average expenditure on education by Ghanaian parents. It came to light that location does not have any influence on the amount parents spend on education. However, the educational level, occupation, sex of the head of the household, as well as the probability by the parents that the child will get the desired job in the future and the benefit that the parents expect to get from their children, were the main factors

that determined the amount the heads of households spent on their children's education. Also, for the decision to spend, the age, level of school, income, number of children in the household and the number of plot owned were the main factors that influenced their decision to spend on their children's education. Finally, it was found that there exists gender bias in the share of education spending in Ghana.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study investigated parents' expectations and investment in children's education in rural Ghana, using intra-household unitary model with the inclusion of the characteristics of Ghanaian rural parents. The study was organized into seven chapters. The first chapter considered the background of the study, the statement of the research problem, the objectives of the study, and the significance of the research. Chapter Two provided both theoretical and empirical literature review of related works. Chapter Three discussed the methodology of the study, the theoretical framework, estimation techniques, population, sample size, sampling techniques, diagnostics tests and their corrections. Chapter Four discussed the demographic characteristics of the respondents, such as the age of the heads of the households, head's level of education, number of spouses and occupation. Chapter Five and Six presented the results from the regression results. The fifth chapter looked at discussion on the determinants of school enrolment of Ghanaian children and what determines the proportion of the children parents enrol in school. Chapter Six discussed the main factors that influence resource allocation within the household.

This study sought to contribute to the literature on parents' expectations and investment in child education in Ghana. The study had six specific objectives: to determine the factors that influence parents' decision regarding the number of children sent to school, to investigate whether or not parents' expectations about

the future benefit, influences their decision to invest in their children's education, to determine the factors that influence parents' decision in terms of the number of boys and girl to enrol in school, to examine the factors that influences parents' expenditure on children's education, to assess the impact of child sex on the composition of education expenditure in the household and finally examine the effect of socio-cultural and environmental factors on the number of children sent to school.

The study investigated parents' decision in relation to investment in children's education. It considered the fact that governments have made various efforts, since colonial and post colonial eras to improve school enrolment in Ghana. Attempts made by governments include the Capitation Grants, School Feeding Programme, Free Uniforms and exercise books. A critical look at the interventions provides indications that these decisions were on the supply side, leaving the demand side. However, without considering the demand side of educational policies, the objective of full school enrolment cannot be achieved.

In pursuance of these objectives, the present study adopted the framework of inter-temporal utility maximization within the overlapping generation's model. The solution of the model led to the model that was used in the investigation of parents' expectations and investment in child-education in rural Ghana.

Primary data was used for the study. Data was collected using questionnaires from sixteen communities in rural part of Ghana using a multi-stage sampling (stratified and simple random sampling) technique to sample the respondents for the study. First, regions in the country were stratified into two

main groups, each having 5 regions. A simple random sampling technique was adopted to select 2 regions from each stratum making a total of 4. Two districts each were randomly selected from each selected region. In each of the selected districts, a simple random sampling procedure was adopted to select 2 communities each to make up 16 communities. Sixty households were selected in each community for the interview. However, due to non responds to certain questions, the final data used for the analysis was 868. The data contained information on the demographic characteristics of the head of the household, their expectations and investment in their children's education. The two stage least square method, Tobit regressions methods, Hurdle model and the Combined Marginal Effect (CME) were employed as the estimation techniques in investigating parents' expectations, investment and educational resource allocation within the household.

Conclusions

The unitary model has been used to give an insight into the decision making-process of parents in Ghana, as most decisions are taken by the heads of the households. Parents consider investment in their children's education as both consumption and investment goods and in any case the decision to invest in their children's education involves the postponement of some current consumption. The decision by the head of the household to invest in the education of their children may be influenced by the average cost of education, discount rate of the head of household, number of children in the household, probability that the

children will get the desired job after school, benefits from investing in children's education, sex of the child, the wealth of the head of the household, level of education of the head and the occupation of the head of the household.

The results of the regression suggest that the benefits the head of the household expect to derive in investing in the children's education play a very important role as regards child educational investment decision. Parents with high expectations of benefits for investing in children's education will tend to invest more in their children's education.

From the study, it was revealed that parents' expectation of a child getting the desired job in the future is significant and positively related to school enrolment. This implies that if parents in Ghana expect that their children are likely to get the desired job in the future they tend to invest more in their education. Therefore, the probability that the child is likely to get a good job in the future plays a critical role in school investment decision of parents.

Also, the average cost of education in Ghana is highly significant and positively related to school enrolment. This means that in Ghana, parents see investment in their children as both investment goods and consumption goods. At this point, the consumption aspect outweighs the investment aspect and there are lots of psychological benefits parents derive from enroling children in school. This psychological benefit is very great in Ghana, so despite increasing cost, parents tend to enrol more children in school.

The time preference of the head's also play an important role in parents decision making. Parents who have a high time preference tend to invest more in

their children's education. This is based on the assumption that parents' investment in child education has other associated benefits than only the physical returns. Therefore, it can be concluded that in Ghana, parents invest in children education are not just for the physical rewards but also for to the psychological benefit associated with the investment.

The study revealed that the number of children in the household plays a significant role in parent decision. In the study, household with more children, enrol lesser number of them in school. Therefore, in Ghana, the number of children is critical and negatively related to school enrolment decision by parents.

On the educational expenditure in the household, the study found that the educational level of the head plays a significant role and is positively related. This means that in Ghana, as parents increase their level of education, they are likely to understand more the importance of education. This situation compels them to spend more on their children's education compared to the less educated parents.

Moreover, the occupation of the head is significant in determining the educational expenditure of parents in the household. The study reveals that parents in protected jobs spend more on their children's education than parents in unprotected jobs. In Ghana, parents who work mostly in government organization are found to spend more on their children education compared to those in the agriculture sector and those self employment.

A conclusion that was drawn from the results of the study was that rural Ghanaian parents tend to invest more in boys' education than in girls' education. That is, there is gender bias in allocating educational expenditure in the

household. Besides, factors that influence parents' decision to invest in their girl child are different from the factors that influence parents when they want to invest in their boys' education.

Also, the study reveals that generally, the location of the parents does not really matter if it comes to taking decision of the number of children to enrol in school. However, if it comes to resource allocation within the household, the location of parents play a vital role. For example, parents in Southern Ghana tend to spend more on their girls education compared to parents in the Northern sector of the country. This bias in education spending is attributed to differences in cultural practices in the country.

Most study in this area considered only the supply-side policy of achieving the target of full school enrolment and the demand side has not been given as much emphasis as the supply side. This study contribute to literature on the demand side of what influence parents decision to enrol children in school in rural Ghana.

Finally, one major innovation in this study was the incorporating of uncertainty of parents into the intra household model for rural Ghana which help to contribute to the understanding of parental decision-making taken on children's school enrolment in rural Ghana.

Policy recommendations

Having looked at parents' expectations and investment in children's education in Ghana, the question then is: What steps should government take in

order to encourage parents' to enrol their children in formal education in order for government to achieve its objective of full enrolment target as set in the Millennium Development Goals (MDGs)? The following recommendations are, therefore, made to enable the government of Ghana to achieve these targets.

Firstly, government policies aimed at influencing the level of school enrolment should not concentrate only on the supply side; the demand side is equally important. For full enrolment to be achieved both sides must be considered in formulating policies.

In addition, the Ministry of Employment and Social Welfare, District and Municipal Assemblies and others governmental agencies must as a matter of priority expand and create more jobs to employ the youth after graduation. For example, the National Youth Employment Programme must be expanded to employ more people. That is, school enrolment can be drastically improved if the opportunity cost of schooling is reduced. The unavailability of job opportunities for the schooled coupled with the demand for the labour of these children in family businesses such as selling, farming; fishing which do not need specialized skills, help to inflate the opportunity cost of education. Therefore, policies aimed at increasing job opportunities for the schooled in the country might help to reduce the opportunity cost of investing in a child's education.

Modernization of the agriculture sector would make parents in rural areas to farm throughout the year. This situation would make it possible for parents to generate more resources to be able to send their children to school and save some for their future usage.

In addition, it has been found from the results that parents tend to prefer investing in their children's education as a result of uncertainty about the employment of the women due to the discrimination in the job market. It is, therefore, important for government to enforce the legislation on discrimination in the labour market against women. This situation will then encourage parents to invest equally in both boy and girl child education.

Also, Government for that matter the Ministry of Education and Ghana Education Services should involve parents in the decision process when formulating educational policies. They should do this by organising focal group discussions at the community level to know the expectations of parents before coming out with the policies. This is because if parents are involved in the decision making process, all their expectations are likely to be met and this will encourage them to send their children to school as they will consider themselves to have been part of the decision making process.

Government should introduce social benefits for parents at their old age or introduce pension schemes for parents during their old age. This will compel them to reduce gender biasness in education by diminishing the importance of parents' expectation concerning their children in their old age. But such pension schemes and social benefits may have the adverse effect of decreasing the amount that parents want to spend on their children's education.

In addition, eliminating liquidity constraints can also have positive effects on children school enrolment. In particular, it would be possible to use microcredit programmes to allow poor parents, who are unable to procure loans

because of lack of collateral, to acquire loans so as to encourage them to invest in their children's education.

Further, the opportunity cost of sending a female child to school can be reduced by government subsidizing the cost of child day care school. If this cost is subsidized, parents can then send their younger children to day care school and this could afford them to enrol girls in the household in school. In Ghana, most girls are not enroled in school because they take care of the younger ones. Subsiding day care centres will therefore, help achieve full enroled.

Finally, the Ministry of Education should abolish all other cost such as PTA dues, extra class that school levy on children and this in term reduce the burden on parents with less financial resources.

Limitations of the study

The results of the study provide insight into parents' expectations and investment in child-education in rural Ghana. However, several important limitations remain. First, the study did not consider the households where the decision process about investment in child education is through a bargaining process.

Also, the study adopted the unitary model where it was assumed that the decision regarding investment in a child's education is solely the responsibility of the head of the household.

In this study, the benefits obtainable from educating children were assumed to be linear though in reality this may not be a linear function. In

addition, assumed a log utility function, which may not be the case in all the study areas. On the other hand, investment in children education by parents takes both material resources and time which are critical to the development of “quality" children who will become productive adults. This study focused on the material investment of children education only and therefore assumes that when parents decide to invest in their children’s education, time is not considered.

Finally, for analytical convenience, it was assumed that the price of the composite goods increases at the rate of interest. However, this situation may not be possible in a country like Ghana as factors that determine the prices of goods are not the same factors that determine the interest rate in the country.

Suggestions for further study

This study has thrown light on parents’ expectations and investment in child-education in Ghana but it cannot be said to be completely exhaustive. Many other issues related to parents’ expectations were not considered due to the fact that decision making processes in households can take different forms. It will be interesting to carry out investigations into parents’ expectations, targeting other models such as collective-bargaining model and also not assuming the benefits obtainable from children’s education as a linear function.

It is hoped that this investigation may throw more light on the current decision making processes in households in Ghana as most decision-making processes in investing in children’s education are made by the whole household, and not only by the head of the family. In addition, the economic resources of

women in the household have not be taken into consideration, so a further study is suggested to consider and investigate the area of Female bargaining power in households in Ghana.

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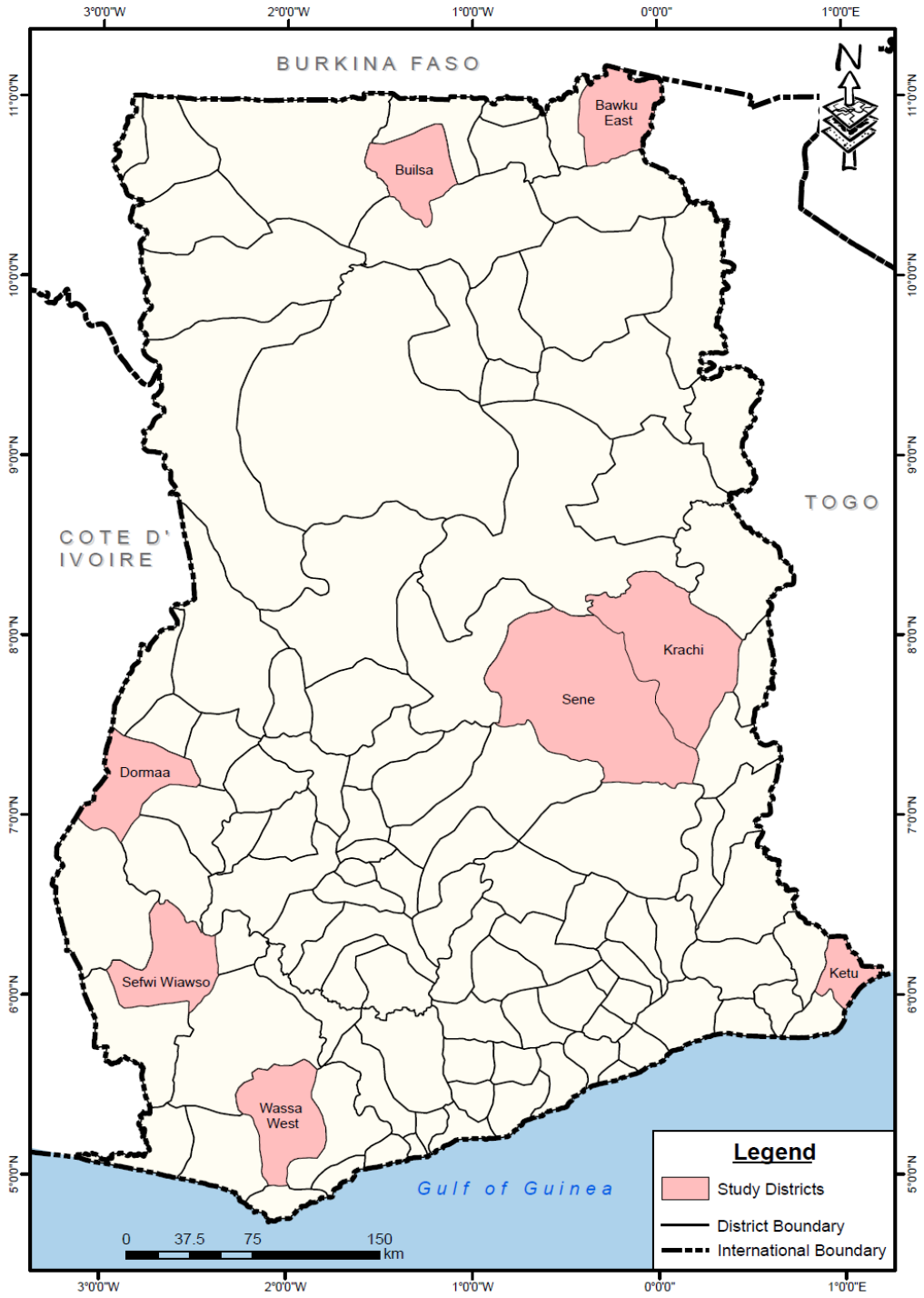
APPENDICES

APPENDIX 1A

Map of the study areas



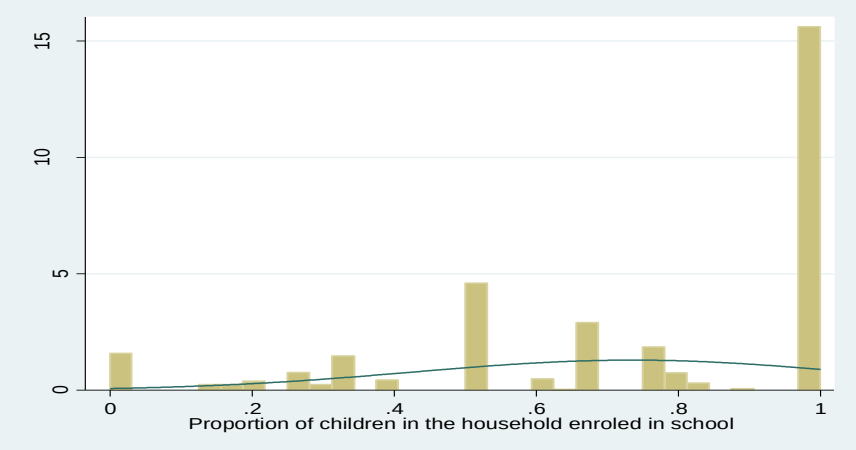
APPENDIX A

Normality test for the variables and its corrections

	Shapiro-Wilk W test for normal[7] data			
Variable	Obs	W	V z	Prob>z
Proportion in school	868	0.99	8.22	0.00
Average cost	868	0.44	620.42	0.00
Benefit	868	0.92	84.53	0.00
Discount rate	868	0.54	507.76	0.00
Wkly expenditure	868	0.71	316.61	0.00
Assets	868	0.26	730.72	0.00
Number of children	868	0.96	46.21	0.00

[7]In conclusion, graphical methods and numerical methods provide sufficient evidence that the variables are not normally distributed.

Figure 1: Proportion of children in school



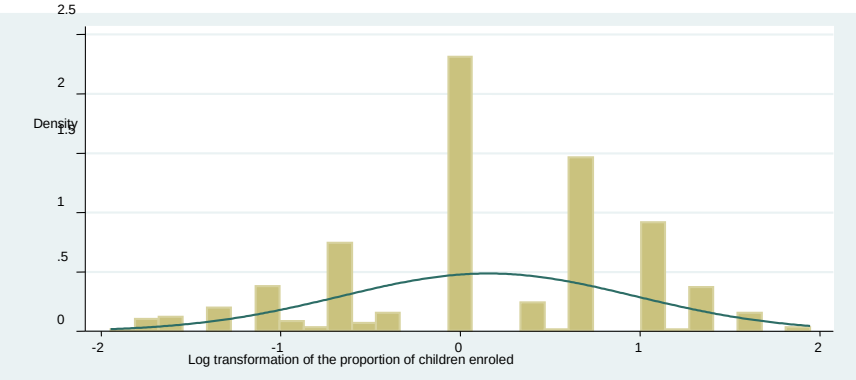
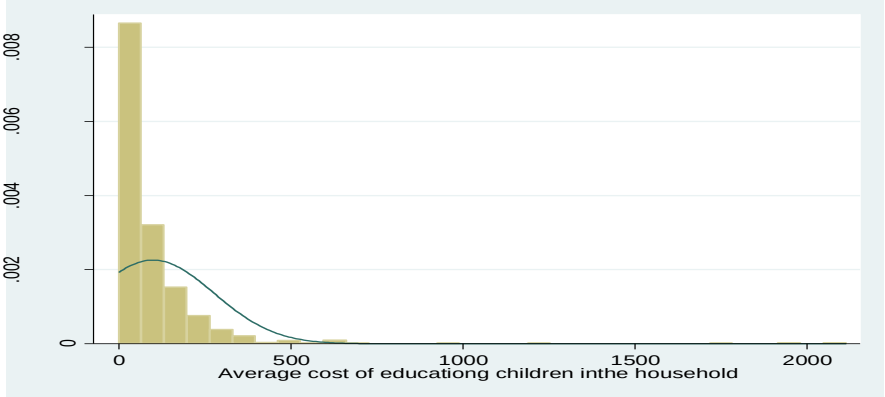


Figure 2: Average cost of education



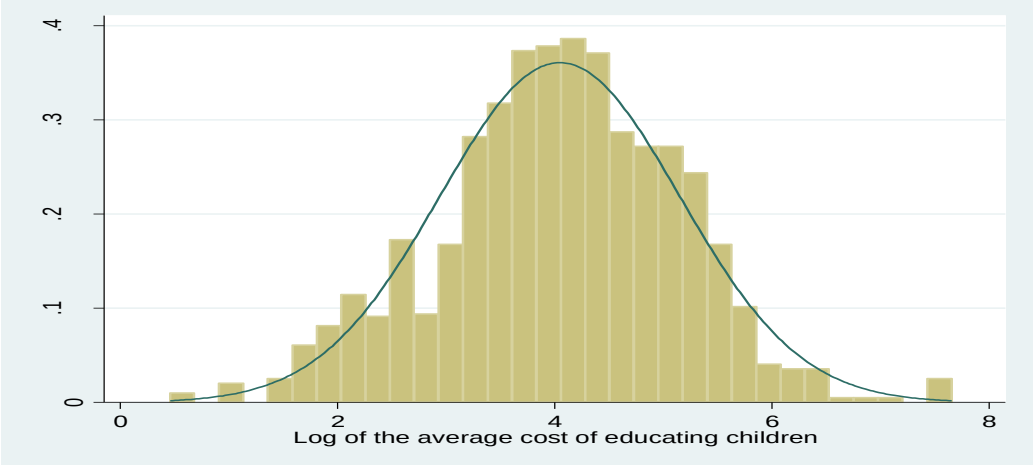
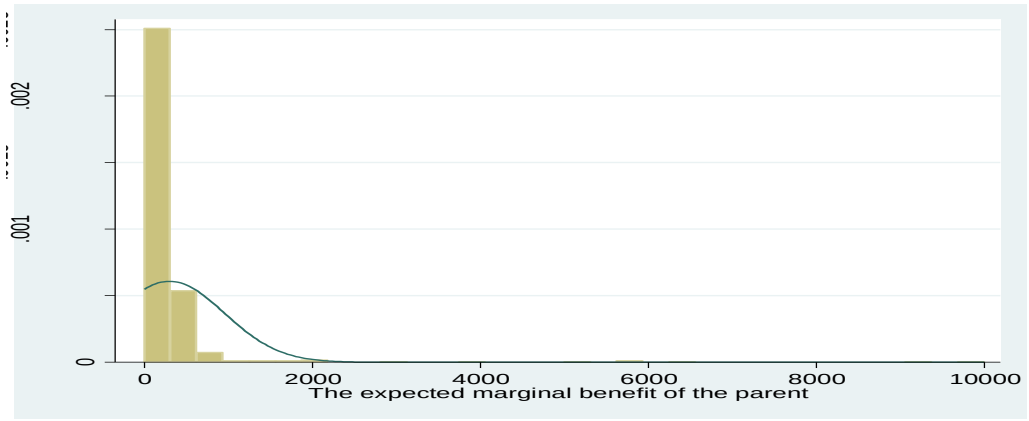


Figure 3: Benefits from child education



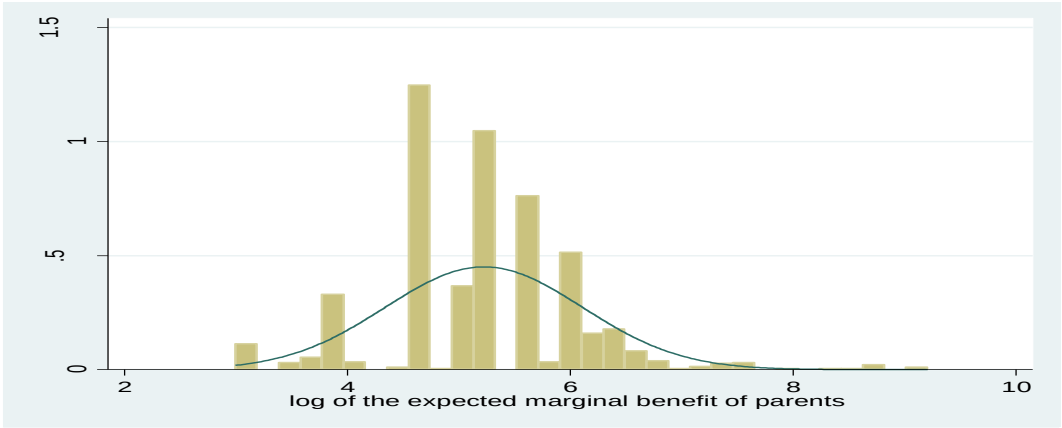
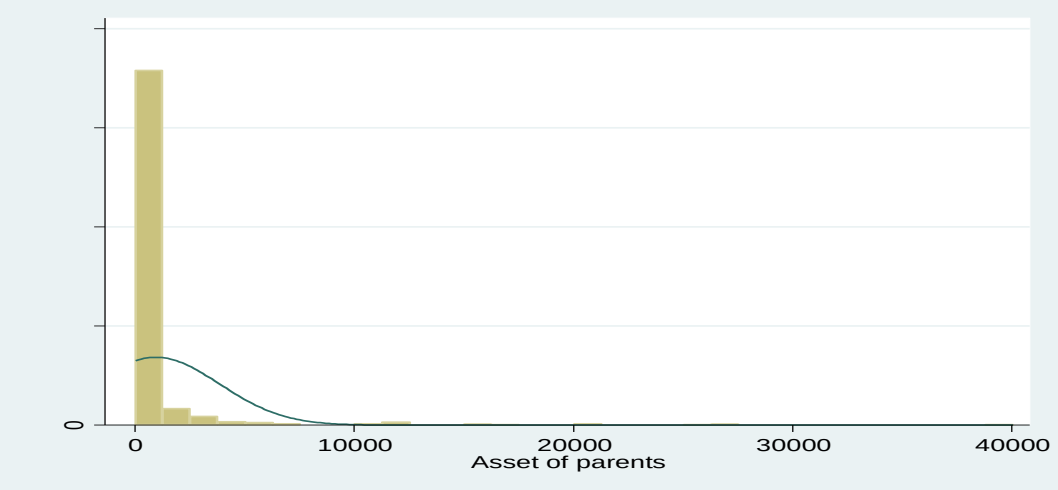


Figure 4: Assets of the heads of households



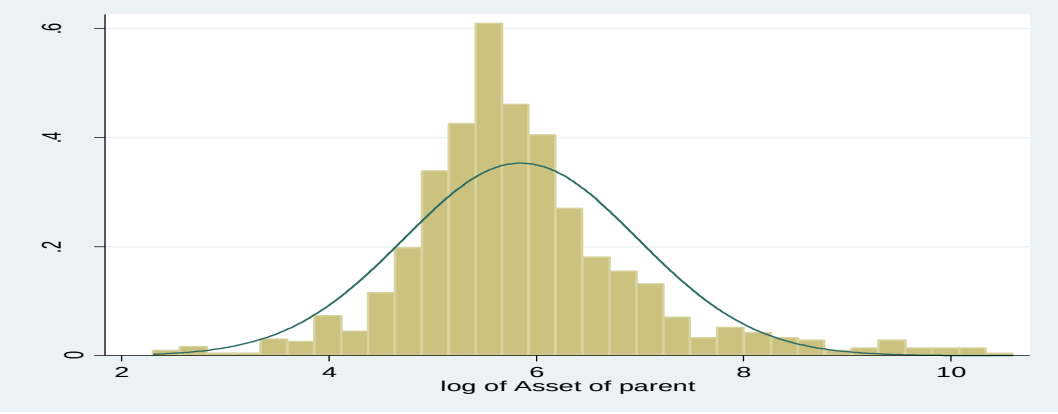
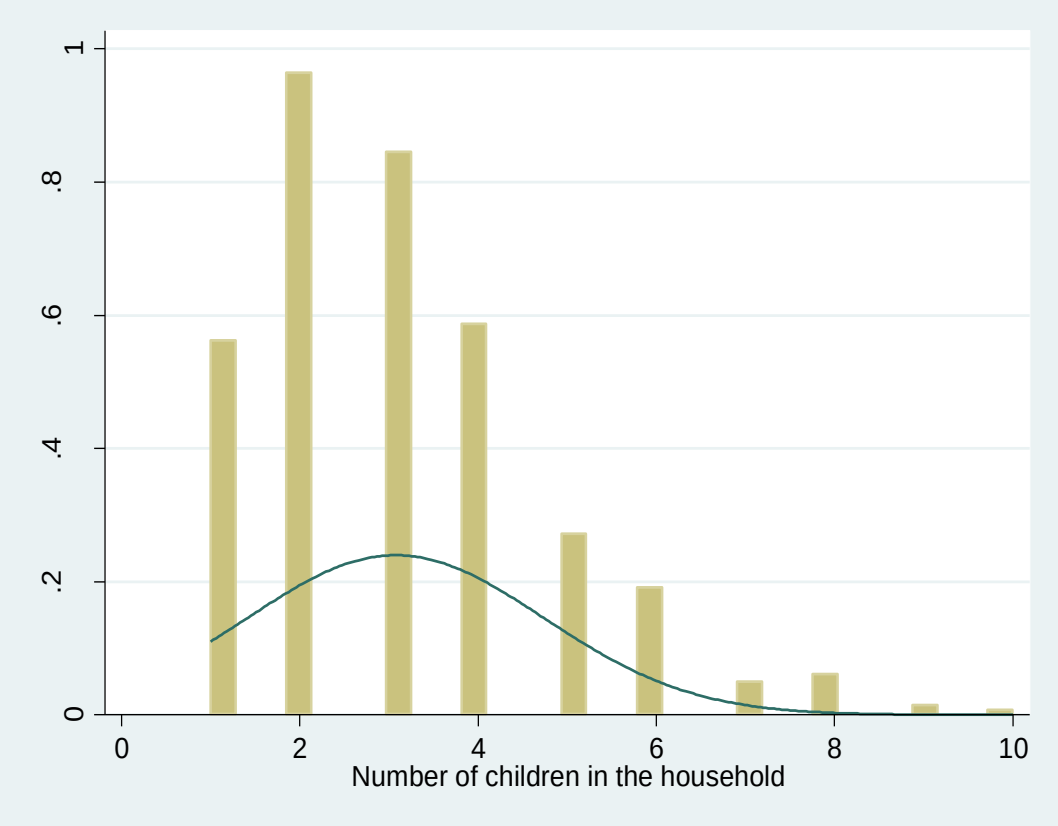


Figure 5: Number of children in household



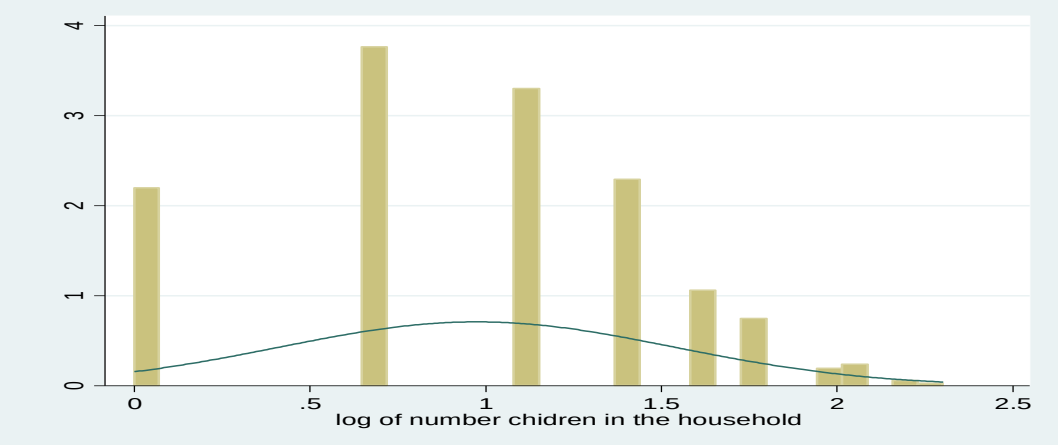
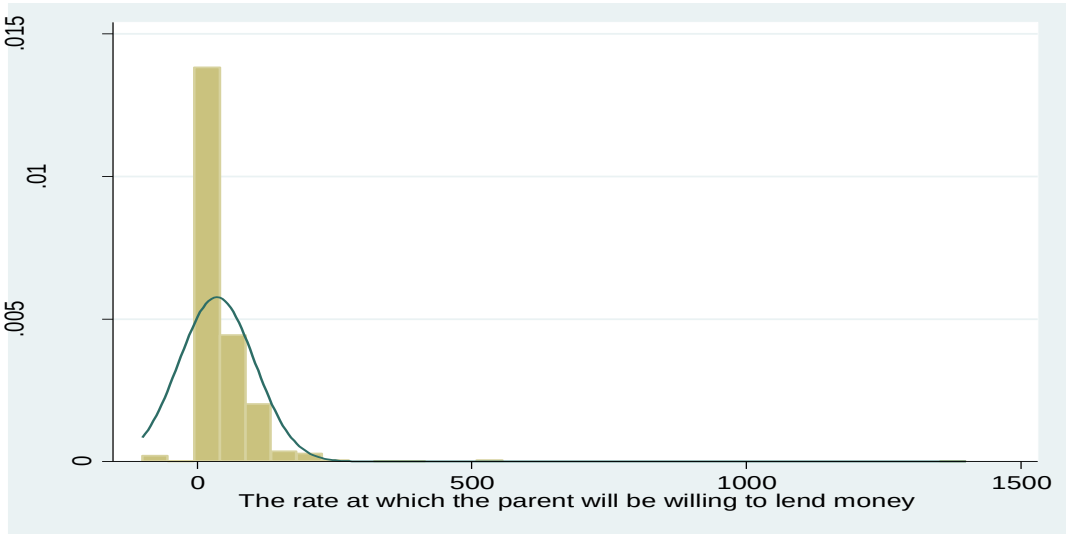


Figure 6: Heads of households' discount rate



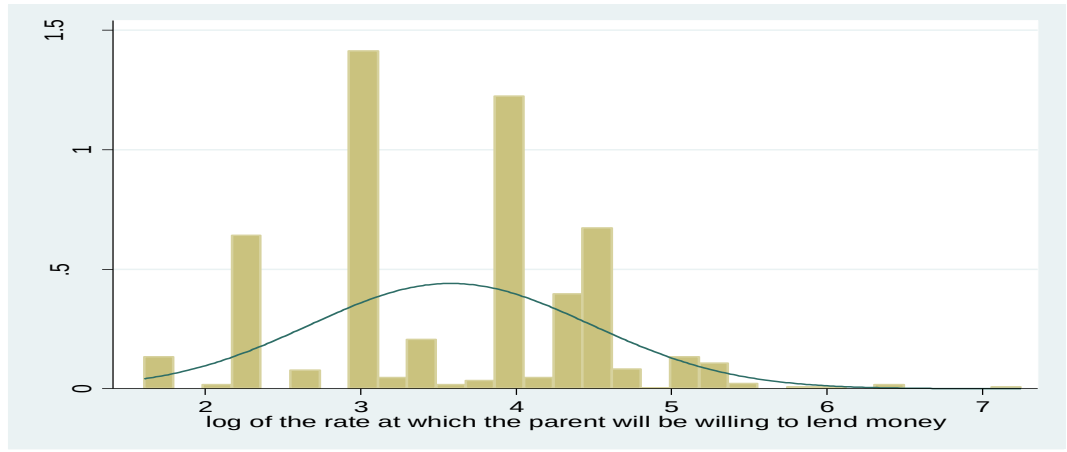
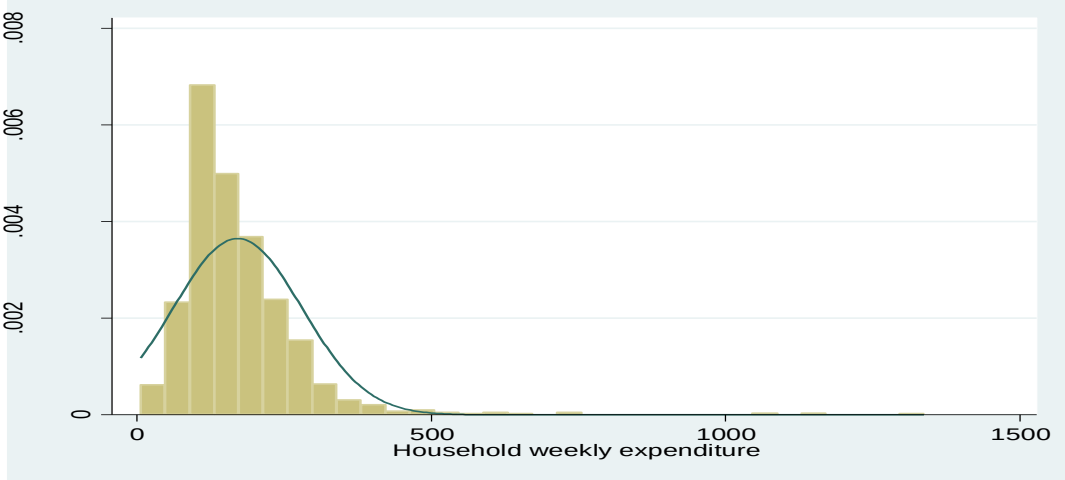


Figure 7: Weekly expenditure of head of household



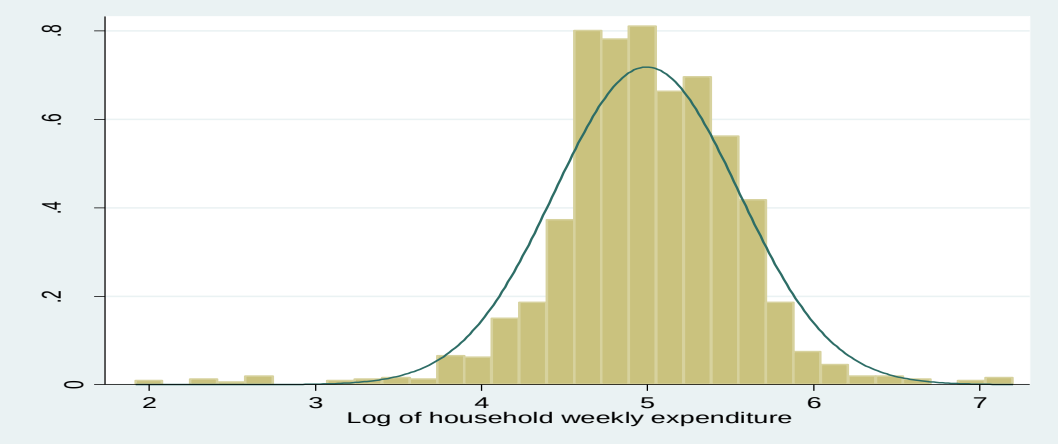
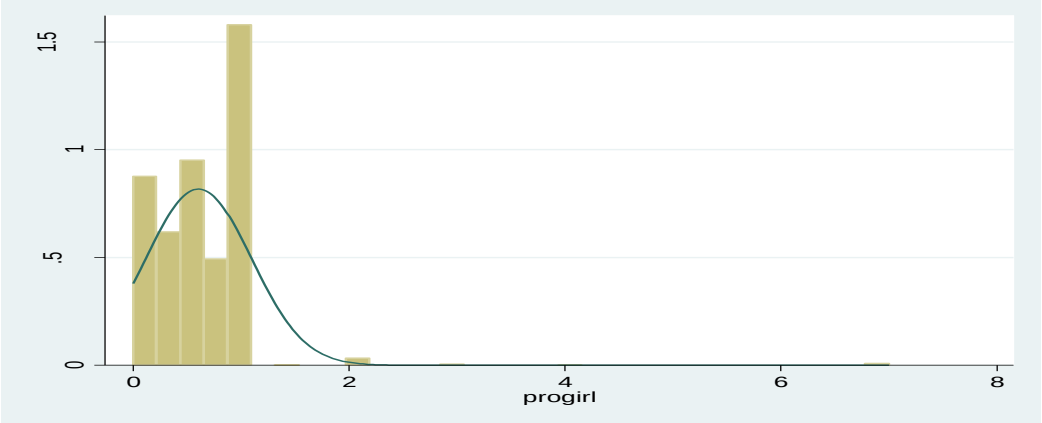
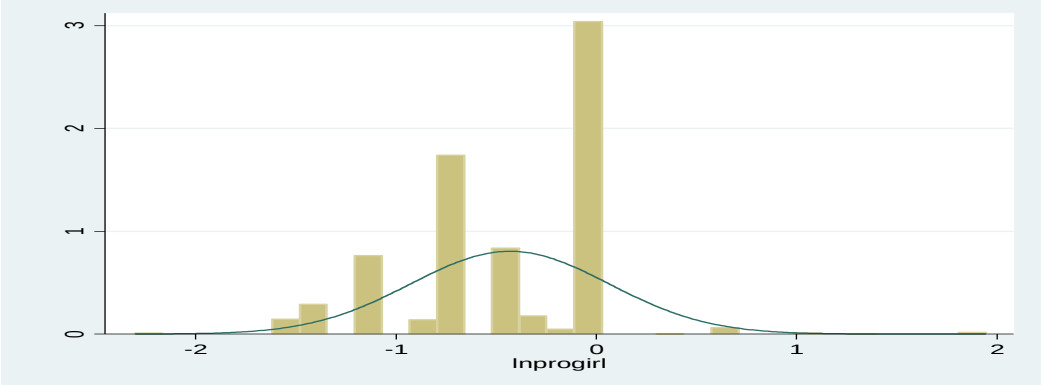


Figure 8: Proportion of girls enroled in school





APPENDIX B

Summary of results of the J-B normality test

	Proportion of school enrolment	Proportion of girls enroled in school	Proportion of boys enroled in school	Log of average cost of education
Mean	0.3077	176.11	108.10	6.7235
Median	0.3171	177.33	118.38	1.4060
Maximum	2.0945	318.02	486.94	197.32
Minimum	-0.9	107.44	-50.	21.009
Standard deviation	0.4	25.	48.	19.
Skewness	0.3	0.4	-	0.4

	169	440	0.2	017
	47	98	667	7
			59	
Kurtosis	3.8	3.2	3.3	3.1
	680	738	530	260
	41	88	22	11
jarque-Bera	3.2	3.0	2.8	3.2
	232	001	770	257
	27	65	30	80
Probability	0.2	0.2	0.1	0.1
	070	546	194	861
	76	55	74	94

Based on a sample of observations, Residuals were estimated from the structural –form equations of 28,30,44

APPENDIX C

Structural Equation: Determinants of proportion of children enroled in school

VARIABLES	Proportion in school
Benefit from child education	0.137***
	(0.0326)
Avg. expd. on chd. Edu.	-0.00962
	(0.0253)
Head of household discount rate	0.0689***
	(0.0229)
Prob. child will get desired job	2.091***
	(0.169)
Heads of households' income	-0.0206
	(0.0165)
Central Ghana	0.00859
	(0.0532)
Southern Ghana	-0.0400
	(0.0510)
Num of chd in household	0.0280**
	(0.0139)
Constant	-1.940***
	(0.125)

Observations	868
Adj.R-squared	0.596

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

APPENDIX D

Correlation Matrix

	Children in school	Av.Cost of education	Number of children	Number of spouses	Age of head
Children in school	1				
Av. Cost of education	0.2442	1			
	(0.000)				
Number of children	-0.3008	-0.1798	1		
	(0.000)	(0.00)			
Number of spouses	-0.0045	0.723	0.041	1	
	(0.007)	(0.236)	(0.034)		
Age of head	0.0279	0.0171	0.6067	0.0155	1
	(0.009)	(0.002)	(0.0500)	0.5386	

Reduced Structural Equation

Variables		
Dependent variable	Log of Expd on educ.	Log of Num of children
Prob. Child will get desired job	3.838*	1.998**
	(2.685)	(0.114)
Number of child in household	0.00724	
	(0.139)	
Benefit from child education	0.446*	0.004*
	(0.356)	(0.005)
Expd on education		0.035
		(1.261)
Heads of households' discount rate	-0.150	4.488**
	(0.461)	(0.166)
Age of head		3.140**
		(1.876)
Number of spouses	0.685	
	(0.818)	
Central Ghana	4.506	0.072
	(0.00)	(0.043)
Southern Ghana	-0.00412	3.047*
	(0.450)	(1.201)
Constant	9.986*	0.567**

	(5.310)	(0.681)
Observations	868	868
Adj. R-squared	0.651	0.731

APPENDIX E

Test for omitted Variables for proportion of children enroled in school

Ramsey RESET test using powers of the fitted values of Proportion of children enroled in school

Ho: model has no omitted Variables

F(3,582)= 104.59

Prob > F= 0.0470

APPENDIX F

Test for omitted variables for proportion of boys

Ramsey RESET test using powers of the fitted values of proportion of boys

Ho: model has no omitted Variables

F(3, 763) = 256.89

Prob > F = 0.061

Ramsey RESET test using powers of the fitted values of proportion of girls

Ho: model has no omitted Variables

F(3, 581) = 260.08

Prob > F = 0.0499

APPENDIX G

Wald test for proportion of children enroled in school

North	Central	South	National
Ben from child = 0	Ben from child = 0	Ben from child = 0	Ben from child = 0
Child get job = 0	Child get job = 0	Child get job = 0	Child get job = 0
Discount rate = 0	Discount rate = 0	Discount rate = 0	Discount rate = 0
Num of child = 0	Num child = 0	Num of child = 0	Num of child = 0
Est. Av cost = 0	Est. Av cost = 0	Est. Av. cost = 0	Est. Av cost = 0
F(4, 366) = 272.66	F(4, 245) = 167.033	F(4, 257) = 467.59	F(4, 868) = 529.04
Prob > F = 0.0610	Prob > F = 0.0499	Prob > F = 0.335	Prob > F = 0.635

APPENDIX H

Wald test for determinants of parents' investment in girls' and boys' education

	North		Central		South		National	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Benefit from educ	= 0	=0	=0	=0	=0	=0	=0	=0
Est. av. cost educ	=0	=0	=0	=0	=0	=0	=0	=0
Child get job	=0	=0	=0	=0	=0	=0	=0	=0
Est. Num children	=0	=0	=0	=0	=0	=0	=0	=0
Patrilineal system	=0	=0		=0	=0	=0	=0	=0
Discount rate	=0			=0			=0	
Male head	=0	=0	=0	=0	=0	=0	=0	=0
Prob > F	0.0499	0.624	0.073	0.121	0.059	0.301	0.341	0.892

Note: =0 represents the null hypothesis for the various sexes and locations

APPENDIX I

Multicollinearity test for factors that determines allocation of educational expenditure

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	hhrel, hhoccup, hhedu, prob of job, hhage, provide	.	Enter

a. All Coefficients[a]

b. Dependent Variable: Educational expenditure

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	55.173	33.765		1.634	.102		
	prob of job,	47.864	14.279	.084	3.352	.001	.900	1.112
	provide	7.446	4.955	.037	1.503	.133	.909	1.100
	hhage	.992	.391	.061	2.536	.011	.967	1.034
	hhedu	1.466	1.020	.034	1.438	.151	.990	1.010
	hhoccup	-.316	1.533	-.005	-.206	.837	.981	1.020
	hhrel	1.588	7.956	.005	.200	.842	.985	1.015

a. Dependent Variable: Educational expenditure

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Prob of job	provide	hhage	hhedu	hhoccup	hhrel
1	1	5.874	1.000	.00	.00	.00	.00	.01	.01	.00
	2	.488	3.471	.00	.00	.00	.00	.96	.04	.00
	3	.318	4.300	.00	.01	.00	.01	.03	.87	.03
	4	.161	6.039	.00	.22	.00	.00	.00	.00	.66
	5	.111	7.290	.00	.42	.00	.29	.00	.00	.16
	6	.039	12.296	.04	.35	.29	.55	.00	.02	.05
	7	.011	23.453	.95	.00	.69	.15	.00	.06	.10

a. Dependent Variable: Educational expenditure

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	eduexpen, hhrel, hhedu, hhage, lnMBen, prob of job	.	Enter

a. All requested variables entered.

b. Dependent Variable: hhoccup

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	6.433	.502		12.814	.000		
	Prob of job	.043	.222	.005	.193	.847	.894	1.119
	provide	-.307	.077	-.099	-4.000	.000	.916	1.092
	hhage	-.023	.006	-.092	-3.864	.000	.972	1.029
	hhedu	.011	.016	.017	.697	.486	.989	1.011
	hhrel	-.187	.123	-.036	-1.515	.130	.987	1.014
	eduexpen	-7.635E-5	.000	-.005	-.206	.837	.986	1.014

a. Dependent Variable: hhoccup

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Prob of job	provide	hhage	hhedu	hhrel	eduexpen
1	1	5.754	1.000	.00	.00	.00	.00	.01	.00	.01
	2	.497	3.402	.00	.00	.00	.00	.76	.00	.26
	3	.428	3.667	.00	.01	.00	.01	.22	.02	.71
	4	.160	5.996	.00	.22	.00	.00	.00	.66	.01
	5	.111	7.214	.00	.41	.00	.29	.00	.16	.00
	6	.039	12.076	.05	.35	.28	.57	.00	.05	.00
	7	.011	22.510	.95	.00	.71	.13	.01	.10	.00

a. Dependent Variable: hhoccup

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	hhoccup, prob of job, hhedu, eduexpen, hhage, provide	.	Enter

a. All requested variables entered.

b. Dependent Variable: hhrel

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.626	.093		17.398	.000		
	Prob of job	-.086	.043	-.050	-2.008	.045	.896	1.116
	provide	-.049	.015	-.081	-3.288	.001	.913	1.095
	hhage	-.003	.001	-.055	-2.294	.022	.966	1.035
	hhedu	.004	.003	.031	1.287	.198	.990	1.011
	eduexpen	1.423E-5	.000	.005	.200	.842	.986	1.014
	hhoccup	-.007	.005	-.036	-1.515	.130	.982	1.018

a. Dependent Variable: hhrel

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Prob of job	provide	hhage	hhedu	eduexpen	hhoccup
1	1	5.592	1.000	.00	.00	.00	.00	.01	.01	.01
	2	.497	3.353	.00	.00	.00	.00	.78	.25	.00
	3	.448	3.535	.00	.00	.00	.00	.16	.62	.18
	4	.293	4.366	.00	.03	.01	.02	.04	.12	.73
	5	.118	6.895	.00	.62	.00	.21	.00	.00	.00
	6	.041	11.747	.05	.34	.24	.63	.00	.00	.02
	7	.012	21.810	.94	.00	.75	.14	.01	.00	.06

a. Dependent Variable: hhrel

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	hhrel, eduexpen, hhoccup, hhedu, prob of job, provide	.	Enter

a. All requested variables entered.

b. Dependent Variable: hhage

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	41.825	1.795		23.297	.000		
Prob of job	-5.435	.861	-.154	-6.315	.000	.914	1.094
provide	.547	.301	.045	1.818	.069	.909	1.100
hhedu	.121	.062	.046	1.948	.052	.991	1.009
eduexpen	.004	.001	.060	2.536	.011	.989	1.011
hhoccup	-.358	.093	-.091	-3.864	.000	.989	1.011
hhrel	-1.107	.483	-.054	-2.294	.022	.988	1.012

a. Dependent Variable: hhage

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	Prob of job	provide	hhedu	wexpen	hhoccup	hhrel
1	1	5.516	1.000	.00	.00	.00	.01	.01	.01	.00
	2	.497	3.332	.00	.00	.00	.77	.25	.00	.00
	3	.452	3.494	.00	.00	.00	.17	.63	.16	.01
	4	.297	4.308	.00	.03	.00	.04	.09	.75	.07
	5	.159	5.888	.00	.28	.01	.00	.01	.01	.59
	6	.067	9.042	.06	.69	.11	.00	.01	.03	.24
	7	.012	21.405	.94	.00	.87	.01	.00	.05	.09

a. Dependent Variable: hhage

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	hhage, provide hhedu, eduexpen, hhrel, hhoccup	.	Enter

a. All requested variables entered.

b. Dependent Variable: pr

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.449	.055		8.146	.000		
	Prob of job	.093	.008	.266	11.692	.000	.978	1.022
	hhedu	.006	.002	.082	3.623	.000	.996	1.004
	eduexpen	.000	.000	.076	3.352	.001	.992	1.008
	hhoccup	.000	.003	.004	.193	.847	.981	1.020
	hhrel	-.027	.013	-.045	-2.008	.045	.988	1.013
	hhage	-.004	.001	-.143	-6.315	.000	.985	1.015

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.449	.055		8.146	.000		
	Prob of job	.093	.008	.266	11.692	.000	.978	1.022
	hhedu	.006	.002	.082	3.623	.000	.996	1.004
	eduexpen	.000	.000	.076	3.352	.001	.992	1.008
	hhoccup	.000	.003	.004	.193	.847	.981	1.020
	hhrel	-.027	.013	-.045	-2.008	.045	.988	1.013
	hhage	-.004	.001	-.143	-6.315	.000	.985	1.015

a. Dependent Variable: pr

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	provide	hhedu	wexpen	hhoccup	hhrel	hhage
1	1	5.549	1.000	.00	.00	.01	.01	.01	.00	.00
	2	.497	3.341	.00	.00	.79	.24	.00	.00	.00
	3	.453	3.499	.00	.00	.16	.65	.14	.01	.00
	4	.301	4.292	.00	.00	.03	.08	.74	.07	.02
	5	.138	6.340	.00	.02	.00	.02	.02	.77	.10
	6	.051	10.445	.02	.20	.00	.00	.02	.04	.74
	7	.011	22.772	.97	.78	.00	.00	.06	.10	.14

a. Dependent Variable: prob of job

APPENDIX J

Wald test for share of household expenditure on education

NORTH	CENTRAL	SOUTH
Education level= 0	Education level= 0	Education level= 0
Age of head = 0	Age of head = 0	Age of head = 0
Sex of head = 0	Sex of head = 0	Sex of head = 0
Num of child = 0	Num of child = 0	Num of child = 0
Income of head = 0	Income of head = 0	Income of head = 0
F(4, 366) = 173.69	F(4, 245) = 301.75	F(4, 257) = 531.07
Prob > F = 0.0309	Prob > F = 0.146	Prob > F = 0.057

APPENDIX K

Ramsey RESET test using powers of the fitted values of share of household expenditure on education (North)

Ho: model has no omitted Variables

F(4, 366) = 637.043

Prob > F = 0.238

APPENDIX L

Questionnaire

Parents' Expectation and Investment in Child Education: Evidence from Ghana Questionnaire

INFORMATION TO BE READ TO THE RESPONDENTS:

Good morning/afternoon/evening. My name is ----------. I am here on behalf of Ferdinand Ahiakpor, a lecturer and PhD candidate at the Department of Economics, University of Cape Coast. He is undertaking a study on the above subject matter and your household has been selected to participate in the study. We promise that your responses will be treated with strict confidentiality.

Please complete appropriately (circle and fill in the space provided)

Structural Num:……Household ID: ……Name of Interviewee:……

Contact Num.:……Date of Interview: ……Name of locality: …….

Start Time…… End Time:……..…

Section I

In the next section, we will ask you a couple of questions on your demographic characteristics, please provide candid responses.

- **Please, are you willing to participate in the study?**

Yes	NO

Demographic Data about the head of household:

ID code **(1)**	Name **(2)**	Marital Status **(3) (A) MATSTAT**	Sex **(4) (B) SEX**	Age **(5) HHAGE**	Religion **(6) (C) HHREL**	Max. level of schooling **(7) (D) HHEDU**	Main occupation current year **(8) (E)HHOCUP**	Ethnic group **(47) (F) HHETHINC**	Number of Spouses **(10) NUMSPUS**

KEYS					
(A 1-single 2-	(E 1-male 2-female	(C) 1-Christian 2-Muslim 3-	(D) 0-never attended school 1-primary not completed 2-primary completed	(E) 1-self-employed in agriculture (mainly food crop)	(F) 1-Akan 2-Mole Dange 3-Ewe

married, with the spouse permanently present in the household 3-married with the spouse migrant/ living outside		traditionnal 4-other	3-Middle/Junior secondary school not completed 4- Middle/JSS completed 5-Senior Secondary School not completed 6- SSS completed 7-Vocational/ technical school not completed 47-Vocational/ technical school completed 10-Post secondary not completed 11- Post secondary completed	2-self-employed in agriculture (mainly fishing) 3-self-employed in non-farm enterprise 4-casual worker /unprotected, unskilled wage worker 5-regular/ protected salaried worker (private) 6-public servant 7-student 8-domestic worker 47-unemployed, looking for a job 10-unwilling to work or retired	4-Ga-Dangme 5-Guan 6-others(Ghanaian) 7-Non-Ghanaian

4- widowe d 5- divorced or separate d				11-not able to work (handicapped)	

Information on spouses ever married

Spouse ID **(11)**	Number of children **(12)**	Age **(13)** **SPUSAGE**	Religion **(14)** (A) **SPUSREL**	Max. level of schooling (B) **(15)** **SPUSEDU**	Main occupation current year (C) **(16)** **SPUSOCUP**

2. Children everborn (from 0 to 15 years)

Child ID **(17)**	Sex (A) **(18)**	Age **(147)** **CHIDAGE**	Indicate which of the children are attending school: **(10)** YES=1 , NO=2 If yes go to (22)	Why is your child not in school? **(B)(21)** **NOSCH**	How many hours/ minutes will it take your child to walk to school **DIST**	What type of work does the child do when not in school? **TYPEWK**	On the average, how much money will the child make in a day, from the work done in 26?l **MONEYDAY**	What level of education do you expect your child to reach in education? **(22)** **CHILDEDUC**

(A) 1-male 2-female

(B) 1 – Cannot afford school costs 2 – school is too far 3 – child must work 4 – child is academically weak 5 – child lost parents, 6 – Other (specify)

23. Are all the children in your household enroled in the same school?

SAMESCH

YES =1	NO =2

24. If no to Q. 4, why are they not enroled in the same school?

State your reasons:

a.----------

b..----------

c.----------

d.----------

On average, how much was spent on the child per year: (Amount in Ghana Cedis) **COSTEDU**

Child ID/SEX (25)	Class **(26)**	Sch. Fees **(27)**	PTA **(28)**	Uniforms **(247)**	Book **(30)**	T$T Per weekly **(31)**	Food at sch. Per weekly **(32)**	Extra classes **(33)**	In your opinion, how would you rank the intelligent of your children **(34)** **INTEL**
01									
02									
03									
04									
05									
06									
07									
08									
047									
10									

1- Excellences (top 5 percent), 2- very good (top 10 percent), 3- average (top 25 percent), 4- below average (75 percent), 5- poor (100 percent)

01= Father	02= Mother	03= Both parents	04= Other relatives	05=Non-relatives	06= Others

35. Who pays for most of the expenses on the child? **PAYEXP**

To what extent do you agree with the following statements:

***Child ID/ SEX* (36)**	Your child would get a job after school **(37)**	Your child would provide for you in future **(38)** (B) **CHIDPROV**	What are the main benefits you expect from your child in the future? **(39)** (C) **BENEFIT**	What type of work do you expect your child to do in future? **(40)** **FUTUREWK**	On the average, how much would you expect your child to earn a month in the future**(41)** **EXPINCOM**	Assume your child earns GHc 500 a month. How much do you expect your child to remit to you a month at your old age**(Ask for each child) (42)**

	(A)**JOB**					**PEREXPTS**
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						

(A$ B). 1- Strongly agree(100 percent), 2- agree(75 percent), 3- neither agree non disagree(50 percent), 4- strongly disagree(25 percent) 5- Don't Know(0 percent)

(C). 1- Care for me, 2- Care for the siblings, 3- Nothing, 4- others

Section I11: Discount Rates using Matching and Choice Experiment DISCOUNT

This part of the questionnaire involves making some choices between two alternatives. Please, **think carefully** before you answer.

43. Suppose the Ghana Education Service wants to implement project **A** or **B** in your community. The two projects cost the same amount of money. Which of the following will you vote for?

Project A will increase your income once by 100GH Cedis by the end of this month (i.e. June)

Project B will increase your income once by 150GH Cedis at the end of 6 months (i.e. December).

A	**B**

Question: If you are to quote a value for alternative **B** that will make you exactly as happy as choosing alternative **A**, what value will that be?_____

SECTION IV: Indications of Wealth

44. How much on the average do your spouse earn a month? **SPUSINCOME**

Spouse ID	Income

45. How much on the average do your spouse spend a month?

SPUSEXPD

Spouse ID	Income

46. How much on average do you earn in a month?

INCOME

47. **Indicate which of the following items you have brought (please tick appropriately) ASSETS**

CODE	ITEMS	REPLACEMENT VALUE	CODE	ITEMS	REPLACEMENT VALUE
47-1	Cassette Recorder		47-16	Poultry	
47-2	Television		47-17	Jewellery	
47-3	Mobile Phone		47-18	House	
47-4	Fan		47-147		
47-5	Refrigerator		47-20		
47-6	Vehicle		47-16		
47-7	Livestock		47-16		
47-8	Land/Plot		47-23		
47-47	Radio		47-24		

47-10	Sewing Machine		47-25		
47-11	Furniture		47-26		
47-12	Stove(kerosene)		47-27		
47-13	Stove (gas)		47-28		
47-14	Bicycle		47-247		
47-15	Cloths		47-30		

NB: Replacement value; ask a question like if you were to sell these assets, how much would you sell each item for?

48. . Do you receive remittances from other family members living elsewhere? **REMPREC**

YES =1	NO =2

49. On the average, how much do you receive from your family members in a month? **AMTREM**

50. Do you send money to your relatives? **SENREM**

YES =1	NO =2

51. On the average, how much do you send to your relatives? **AMTSEN**

52. Average monthly expenses from your income **WEXPEN**

ITEM	Do you make expenses on the following items from your income?		Monthly expenditure (GH CEDIS)
	YES	NO	

Spices, sugar, salt and cooking oil			
Firewood, charcoal, kerosene, etc			
Beverages, milk			
Vegetables			
Grains and Flour: maize, rice, millet, etc			
Fish, meat, Egg,			
Other food items			
Alcoholic items			
Detergents/soap			
Recreation/Cinema, etc			
Transport			
Religious Donations			
Others			

Section V:Risk Attitude (Using the Becker-DeGroot-Marschak mechanism)

HHRISK

53. For this part of the questionnaire you will be given a **lottery ticket**, which you can sell or keep and participate in a gamble. You are allowed to quote the price **only once**. The buyer has equal probability of offering any of the following prices [5; 10; 15; 20; 25; 30] GH¢. If your price is higher

than what the buyer offers, your ticket will not be bought and you will have to participate in the gamble. On the other hand, if the buyer's price is the same or higher than your price you will receive the price offered by the buyer. If your ticket is not bought, a die will be tossed and you will be paid if you win and receive nothing if you loss. Your best interest is served by representing your honest choice.

Individual	Uncertain Amount (G)	Chance of winning	The selling price of the ticket	Remark
1 (e.g.)	60 GH¢	$\frac{1}{3}$ (i.e. 1 out of 3)		

- If there is anything you don't understand please ask before you quote the price. You cannot change your decision after quoting the price.

54. Do you have any suggestion as far as your child's education is concerned?----------

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