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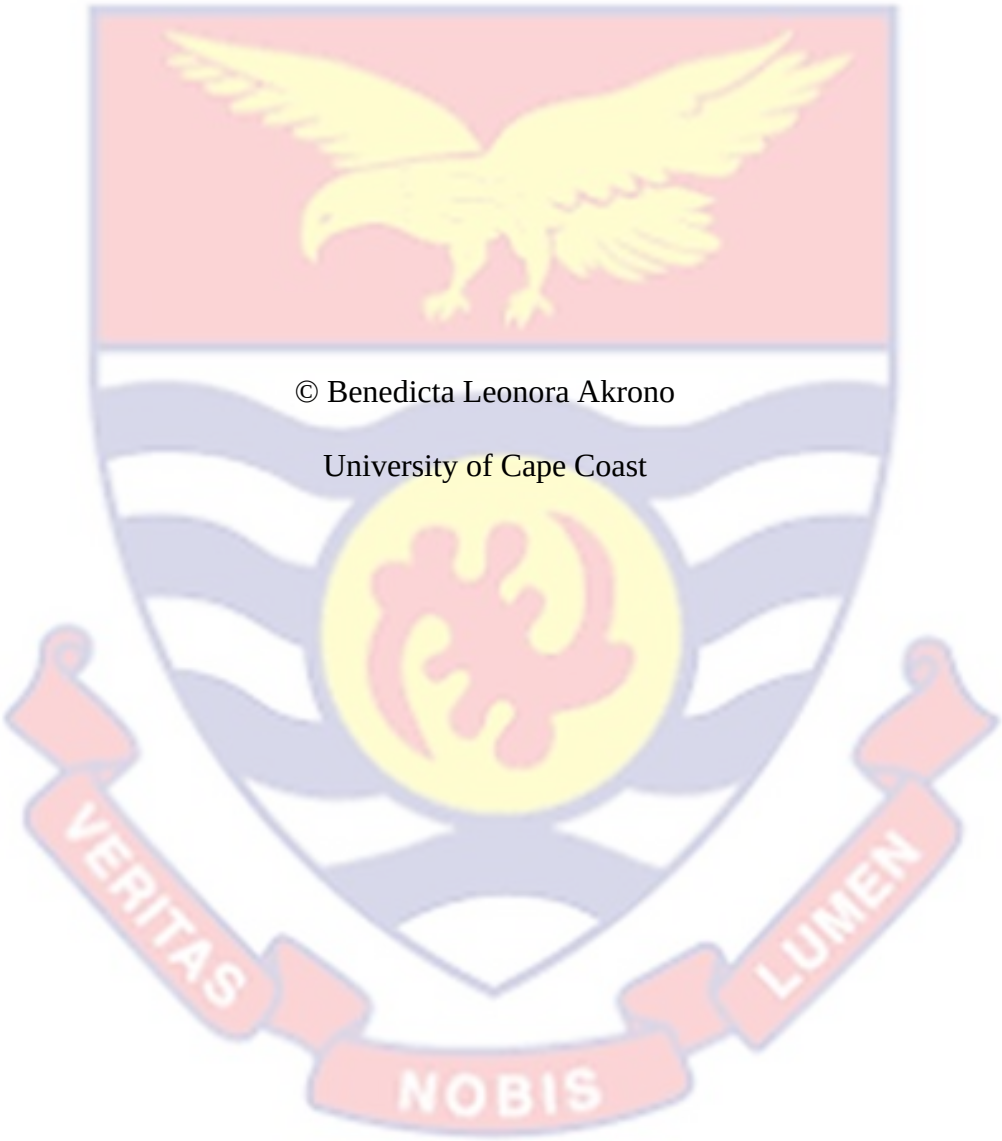
BENEDICTA LEONORA AKRONO

2020



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CHILD LABOUR AND HUMAN CAPITAL FORMATION IN THE CENTRAL REGION OF GHANA.

BY

BENEDICTA LEONORA AKRONO

Thesis Submitted to the Department of Economic Studies of the School of Economics, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for award of Doctor of Philosophy degree in Economics

DECEMBER 2020

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: Benedicta Leonora Akrono

Supervisors' Declaration

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

Principal Supervisor's Signature:…….…... Date:……

Name: Prof. Ferdinand Ahiakpor

Co-Supervisor's Signature:…… Date:……

Name: Prof. James Atta Peprah

ABSTRACT

The study focused on 'Child Labour and Human Capital Formation in the Central Region of Ghana'. In general, the study focused on the parents' attitude to supply child labour and how it affects child human capital formation of children between 5-17 years in the public basic schools in the Central Region of Ghana. A multi-stage with simple random and purposive sampling techniques were used in the study. A total sample size of 788 children with their parents were interviewed. Head teachers/class teachers served as informant. A detailed structured interview with questionnaire was adopted as the data collection technique for the study. Probit, biprobit, ordinary least squares, IVprobit and propensity score matching models were adopted for the estimation. The findings of the study showed that parental attitude of positive stigma significantly increases the probability of child labour participation. Child labour participation and child labour hours significantly hinder child human capital formation in terms of education and health outcomes. Children involved in hazardous nature of work and child labour hours are gender-specific for boys. It is recommended that Ministry of Education and Ghana Education Service through the Inspectorate Board should design truancy policy that would be enforced on parents to reduce child participation in economic activities and promote the free compulsory universal basic education policy. In addition, the district assemblies must sensitize and educate the public on the hazardous nature of child labour activities and the likely health implications on children's welfare.

KEY WORDS

Child labour

Educational outcome

Health outcome

Human capital formation

Parents' attitude

ACKNOWLEDGEMENTS

The generous cooperation of many people has contributed to the success and completion of this thesis. I would like to express my special thanks to my supervisors, Prof. Ferdinand Ahiakpor and Prof. James Atta Peprah, both at School of Economics, University of Cape Coast, for their professional guidance, encouragement, critical comments and suggestions which enhanced the quality of this work.

I am grateful to my dear husband, Dr. Francis Narh Akrono for the goodwill and support in making the completion of this work a reality.

I am most grateful to Mr. Michael Coffie, School of Economics, University of Cape Coast for his contribution on data management and analysis.

Finally, I would like to express my appreciation to all those who in diverse ways helped to make this thesis a success.

DEDICATION

To my parents of blessed memory and children.

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LIST OF ACRONYMS

BECE	Basic Education Certificate Examination
EFA	Education for All
fCUBE	free Compulsory Universal Basic Education
GDHS	Ghana Demography Health Survey
GER	Gross Enrolment Ratio
GLSS	Ghana Living Standard Survey
GSS	Ghana Statistical Service
ICT	Information and Communication Technology
ILO	International Labour Organization
JHS	Junior High School
MICS	Multiple Indicator Cluster Survey
MLSC	Middle Living School Certificate
MoE	Ministry of Education
HAF	Hazardous Activity Framework
OLS	Ordinary Least Squares
PTAs	Parents Teacher Associations
SAGE	Schooling for age

CHAPTER ONE

INTRODUCTION

Children engaged in economic activities, generally referred to as child labour constitutes one of the major socio-economic phenomena that has plagued the continents of Asia, Latin America, Africa and Ghana in particular (ILO, 2013). According to this ILO report, more than 265 million children are engaged in employment, out of which 168 million aged 5-17 years are into child labour. Out of the estimated number, 115 million of these children in employment are found in Africa with over 85 million in hazardous work such as mining and agriculture sectors. The first section of this chapter provides the background to the study on child labour, whiles the second highlights the problem statement focusing on what has been done and the gaps that need to be bridged in literature. This is followed by the purpose and objective of the study, hypotheses, significance of the study, scope and finally the organisation of the study.

Background to the Study

The importance of human capital formation for economic development is well recognised. Since Adam Smith set out to explain how nations could acquire wealth in 1776, Becker (1964), Mincer (1974) and Sen (1985) have contributed immensely to the discourse on the role that human capital theory plays in individual, families, society and the economy since the 1950s. They argued that human capital investment provides a fundamental means of improving the quality of human resources that are available for national economic development. One aspect of human capital formation is education, and Sen (1985) theorised that at least the ability to read, calculate and process

information is important for normal daily life activities. Therefore, it is worth going to school since it protects children from early labour market entry, promotes social equity and the possibility of better employment that would transform the unproductive individuals to productive population, which would help in transforming the key sectors of the economy for wealth creation and poverty reduction.

Contingent to the economic importance of human capital formation, various Governments of Ghana have formulated and implemented various policies in promoting basic education for every child. Policies such as the Education Act of 1961, Kwapong Review Committee in 1966, Dzobo Review Committee of 1974, Educational Reform Program in 1987, the fCUBE in 1996, Review of Educational Reforms in 2007, Education Act of 2008 all championed free and compulsory basic education towards ensuring basic educational attainment for all. Focusing on the fCUBE because of its relevance to the erstwhile millennium development goals (MDGs) and the sustainable development goals (SDGs), the policy promised access, equity, quality and relevance to basic education. These policies were of great value to the household interdependent decisions and the nation as well because successful basic education is a stepping stone towards good health and consequently economic development.

In addition, other initiatives to boost basic educational access were introduced: capitation grants, school feeding programmes and distribution of exercise books (Acheampong, 2009). The policies and initiatives saw a positive move in education. For example, the World Bank (2013) Report revealed that, improvement in basic education particularly among the poor regions of Asia

and sub-Saharan countries, has progressed enormously since 2000s. Ghana has also progressed in educational access across the levels of basic education. Thus, enrolment and retention being the key objectives of fCUBE, have improved, and out-of-school children have also witnessed impressive reductions (MoE, 2013). Evidence shows that approximately eighty-nine percent of children aged 5-17 years are currently enrolled in school, boys accounting for 89.4%, 88.3% girls and 5.2% are out-of-school, respectively (GSS, 2014:14).

Notwithstanding the progress reports in basic education, the fCUBE did not go further to consider quality in the enrolment drive and that basic school performance has remained a challenge (Darvas & Balwanz, 2014). Evidence from GSS (2008) Report confirmed increased in enrolment but irregular school attendance. Similarly, the GLSS 6 (GSS, 2014) in a Child Labour Report noted that a number of children enrol, but attend school intermittently or completely drop-out from school. A study by Wolf, McCoy and Godfrey (2016) evaluated enrolment in the Ghanaian education and reaffirmed the problem of irregular school attendance. Hence, there is one way of enrolling a child in school and attending school as well and these indicate great threat to the objective of the educational attainment for all agenda. The human capital and educational production theories make it clear how educational time spent is critical in the process of producing an output through accumulation of minimal capabilities (Sen, 1985; Becker, 1993).

This brings to the fore that; the education of children is a household decision and the demand for it depends on the different ways households perceive education as a valuable asset and how schooling time of the child is allocated. Accordingly, one major obstacle that conflict with allocation of

schooling time and hinder the prospect of human capital formation is children engaging in economic activities (ILO, 2017). Indeed, schooling and working are two mutually exclusive events for which both cannot occur at the same time and one interferes the other's success.

Over the years, the survey of the GSS (2008 & 2014) has revealed that higher proportion of children combine work with schooling. In 2008, it was reported that children between 7-14 years constituting 54.2% from estimated 612,388 children were economically active. The 2014 Survey also reported that 81.1% children (5-17 years) are schooling and working concurrently. To buttress the above statistics, over 2 million children are working in some kind of economic activity for which 21.8% are in child labour, working up to 42 hours per week. In addition, the latest report (GSS, 2019) also reiterated that 88.6% out of 7 million children, aged between 5-14 years are also engaged in economic activities for which 29.2% are child labourers. Although, there are different cut-off points in age, the statistics depict continues increase in children working and schooling at the same time and this may obstruct human capital formation.

Cognisant of the data increment of child labour over the years, makes it imperative to empirically inquire about the kind of work and its nature. ILO (2017) notes that children in the labour market are found in various kinds of work and in many activities, mostly in the agricultural sector, especially fishing (deep sea fishing) and its related activities. Additionally, other occupational activities such as small-scale mining, quarrying, head porter or carrying of heavy loads, work involving the production or use of chemicals and servitude. Children who are engaged in agriculture/fishing activities form 76.8% while

14.9% of the children provide services and less than 5% children are in other activities. Most of these works are dangerous, exploitative and hazardous in nature (Hamenoo, Dwomoh & Dako-Gyeke, 2018). The intensity of child labour according to the various survey report is quite high with four out of every five children working between 40 to 49 hours per week.

Children Act (1998) prohibits children from engaging in work that is liable to affect child's welfare. The Act has also categorized fishing and other related activities as hazardous and some researchers have become interested in this area. Based on this premise, studies have been undertaken in the area of fishing activities on the Volta Lake environment (Annim & Darteh, 2007; Agbenya, 2009; ILO, 2013a; ILO, 2016). Some of these areas include: Pru, Keta, Ketu, North Tongu, South Tongu, Sene, Kwahu North (Afram Plains) and Tolon-Kumbungu. These authors maintained that a high number of children are trafficked to work in the fisheries at the Volta Lake and they are being exposed to hazardous and worst forms of child labour. Therefore, it becomes important also to concentrate on the marine fishing activities and as such regions that lie along the coastline are considered.

As shown in Table 1; children working and schooling in the agric/fisheries/forestry of Central Region accounts for 83.2%, highest among Volta (82.4%), Western (67.8%) and Greater Accra (7.2%), and 99% of the children work between 1-42 hours per week. Comparatively, children engaged in agric activities and hours worked is more significant in Central Region and therefore, the Region becomes more appropriate for the study.

Table 1: Distribution of Schooling Children and their Engagement in Economic Activities by Regions of Ghana

Region	Agric/fishing/ Forestry	Hours worked 1-42 hours	Enrolment
National	76.8	95.4	88.9
Western	67.8	98.4	93.1
Central	83.2	99	91.4
Greater Accra	7.2	95	92.6
Volta	82.4	82.8	85.3
Eastern	75.6	98.4	92.1
Brong-Ahafo	81.7	97.5	90.9
Ashanti	72.4	96.4	92.2
Northern	81.7	96.8	70.5
Upper West	86.2	91	85.8
Upper East	98.4	94.8	87.3

Source: GSS (2014)

Alongside the nature of economic activities, is the extent to which some work activities impede schooling and health outcomes. Indeed, the parallel negative effect of children in economic activities and how they interplay is critical to achieving universal basic education for all, promoting basic capabilities, sustainable livelihoods and good health outcomes. In a national child labour survey, more than half of the children in child labour were noted to suffer abuse. They are also exposed to relatively high work-related health risk and dangers as well as the occurrences of injuries/illness (GSS, 2014).

Focusing on schooling, Hamenoo et al. (2018) put forward that, child labour adversely affects children's commitment to education in terms of school attendance; becoming intense in rural setting where children do part-time instead of attending school regularly. In terms of health outcomes, Nicollela and Kassouf (2018) and Ahmed and Ray (2014) noted that labour performed by children increases health risk leading to long, medium or short-term consequences as well as reducing health capital stock. Based on the proposition that children in the labour market possess decreasing human capital stock, Emerson et al. (2014) asserted that adult stage of these children make their offspring become prone to early labour market entry, thus, perpetuating the cycle of poverty. The negative effect underscore the challenge and threat in achieving Education for All (EFA) and the fourth objective of Sustainable Development Goals.

The above arguments raise this question: Are there some factors which cause children to work and therefore likely to hinder human capital formation? Thus, Basu and Van (1998) altruistic theory has stressed the role of poverty in line with luxury axiom as a major hindrance to human capital formation, in that child only works when household income falls to the subsistence level. Empirically, it has been confirmed across the world (Sasmal & Guillen, 2015; Kumar, 2015; Guarcello et al., 2016; Quattri & Watkins, 2016). However, some researchers like Dammert, de Hoop, Mvukiyehe and Rosati (2017) and Fors (2012) have questioned the issue of poverty and have illustrated the fact that child labour maybe caused by a specific assumption that underpin an economic situation in a household. Therefore, the purpose of this study is to focus on non-

poverty factors in explaining the prevalence of child labour by paying attention to parents' characteristics.

In response to the parental characteristics, empirical studies have explored the factors that determine child labour (Sahu, 2013; Abou, 2014; Bahar, 2014; GoG, UNICEF, ILO & ICI, 2017; Ayifah, 2018; Afriyie, Saeed & Alhassan, 2019). While these studies have used variables such as parents' educational background, family culture, parental neglect, peer influence, family size, ethnic violence and religious affiliation as some indicators of non-poverty factors, the focus of this study is to provide evidence that household decision on child labour supply may be influenced by parental attitude. Patrinos and Shafiq (2010), Tafere and Pankhurst (2015), Ariyanti (2016) and Edoh-Torgah (2018) discussed the case where parents exhibit positive conception about child labour and found that child labour provides immediate skilled employment for children and for that matter it is safe and could be combined with schooling. These studies relied on the one parent's decision for all. However, the difference in parental attitudes could also be a factor that underlie incidence of child labour. Therefore, household decisions concerning the time allocation of the child lies between two adults (not necessarily biological parents) in the household.

Theoretical and empirical works of Becker, view the household as unitarian and for that matter, have common preference about how to allocate child's time. However, the unitarian assumption has been critiqued by few theoretical works based on the fact that the household cannot always have a common decision preference over time allocation of the child (Lundberg & Pollak, 1993; Browning & Chiappori, 1998; Doss, 2013). Doss (2013) notes

that household members (adults) may also have diverse decisions as it relate to the child's time use. It must be stressed that issues of child human capital formation are risk decisions to the household, and two adults in the household could have conflict of interest in attitude towards child labour as this may affect the child human capital formation. One implication of the diverse parental attitude is that one agent has the opportunity to negotiate with the other agent between child working in economic activities or schooling. Thus, if one agent obtains higher marginal disutility from the child who is working, the inability of exertion of bargaining power from the other agent is likely to cause incidence of children working in economic activities. Hence, differences in parental attitudinal preference may be a key factor of prevalence rate of children engaging in economic activities across households.

Therefore, this research intends to integrate the two key agents; regarding the household decision to make considerations on the child's human capital formation in the Central Region of Ghana.

Statement of the Problem

Despite the various educational policies and reviews formulated by government to ensure educational attainment for all, children working in economic activities and schooling concurrently, still persists in Ghana, with Central Region being one of the regions with high prevalent rate. Following the thrust of the study, 99% of the children from Central Region work up to 42 hours per week with prevalence rate of 83.2% children in agric/fishing/forestry, higher than Volta, Western and Greater Accra Regions, respectively (GSS, 2014). Therefore, failure to pay attention to children's participation in the

labour market in Central Region may lead to missing opportunities to formulate and implement policies crucial for national development.

In this respect, what then determines children's participation in economic activities? Thus far, theoretical and empirical literature have identified and confirmed that household poverty (monetary factor) is the main determinant of child labour in developing countries (Basu et al., 1998; Kumar, 2015; Sasmal & Guillen., 2015; Keane et al, 2018; Afriyie et al, 2019). Children participate in labour market because resources in the household are not sufficient for the upkeep of the household. However, apart from poverty, some empirical studies have also indicated non-monetary factors such as household preference, parental expectation, employment status, cost of education, women economic capacity, educational level of parents, child neglect, child's age, household size, accessibility to school and religious affiliation have significant influence on children's participation in labour market (Frempong & Stadelmann, 2020; Basu & Dimova, 2020; Hamenoo et al., 2018; de Hoop et al., 2017; Ariyanti, 2016; Mukherjee & Pal, 2016; Tafere & Pankhurst, 2015; Abou, 2014).

However, it appears that literature is scanty on the parental attitude regarding incidence of child labour and the study intends to examine how parents attitude toward their child affect the prevalence rate of child labour. Tafere and Pankhurst (2015), Ariyanti (2016) and Edoh-Torgah (2018) have already identified that positive attitude of parents influence child labour directly, thus, relying on unitary theoretical approach. According to Doss (2013), different parents may have divergent attitudes with regard to child labour which may influence their decision to either send their children into work or otherwise. That is parents who have positive attitudes towards their child's

work is likely to increase the incidence of child labour relative to parents with fewer reservations. However, despite the plausibility of this hypothesis, parental attitude towards child labour has not explicitly been controlled for in previous studies. Therefore this study deviates from the former studies and control for parental attitude towards child labour. Again, unlike previous studies, parental attitude is considered as an endogenous variable which is likely to increase the robustness of the findings.

Also, worthy of empirical attention is the extent that child labour may have detrimental effect on child's schooling outcomes. Theoretically, Hanushek (1995) and Glewwe (2002) have underscored the trade-off between early labour entry and human capital formation. On the empirical side, child labour is found generally as disinvestment to human capital formation as it compromises the intellectual ability to schooling outcomes necessary for national development (Holgado et al., 2014; Keane et al., 2018). The studies on child labour and its consequences on education have mainly been conducted, particularly in Asian and Latin American countries (Putnick & Bornstein, 2015; ThuLe & Homel, 2015; He, 2016; Bogga, 2019; Emerson et al., 2017; Keane et al., 2018). Most of these previous studies pay attention to child labour and school attendance or enrolment with few studies on educational performance. For example, Putnick and Bornstein (2015) and Borga (2019) explored whether child labour is a barrier to school enrolment and found a significant negative effect. Another study by Canelas (2015) and Hamenoo et al. (2018) also affirmed the negative impact of child labour to school attendance. A point of criticism is the fact that; school attendance and enrolment are the initial indicators of the human capital formation and these are needed to produce an

output (educational performance). Also, enrolment has been equated to school attendance; measured in qualitative terms rather than quantitative measurement. As such enrolments and school attendance are not sufficient indicators to measure the potential harm of child labour to human capital formation and do not take into consideration the quality of child's cognitive experience in school. As regards to impact of child labour on educational performance, Keane et al. (2018) found a significant and negative effect that child work impair learning in terms of child studying at home. Another study by Emerson et al. (2017) also estimated that child work negates learning outcomes with respect to test scores. Of course, other studies such as Mukherjee and Pal (2016) and Cuesta (2018) have also confirmed that child labour affect the educational production for that matter hours spent studying at home and schooling become a challenge.

There are some shortfalls that have been identified in the abovementioned research works. First, these studies only used subjective measures of performance which increases the potential of measurement error. Thus, the proxy for child's learning outcome has been the heads of household' own assessment on time spent studying (home/school) which is likely to cause bias. Second, child labour is treated as an exogenous variable in these studies consequently making their findings doubtful. The above issues have weakness related to assessment of child labour on educational outcome. To address these issues, an objective (teacher-made-test) measure to assess the extent of how child labour affect cognitive skills development and also the propensity score matching technique would address the endogeneity problem. This direction is appropriate since it measures every child's academic progress and performance daily per term in the academic year in accordance to the educational curriculum

(Nitko, 2001). Thus, it enhances educational production, since cognitive skills is the fundamental determinant of future earnings (Glewwe, 2002).

Lastly, given the fact that the child participates in economic activity, works for hours or involves in hazardous types of work, could it also affect child health outcomes? Considering the framework of Grossman (2000) and Jacobson (2000), young children are prone to health risk, based on the nature of work done as it is more likely to reduce the inherent health capital stock. This indicates that human actions and inactions can have significant effects on health. Despites its theoretical importance, the empirical evidence of child labour and adverse health outcomes seem to be relatively developing and existing studies mostly focus on long-term effect which also remains inadequate (Nicollela & Kassouf., 2018).

In view of this, the short-term effects also appear limited in knowledge. However, few studies such as Guacerllo, Lyon and Valdivia (2016) and Sundjo, Baye, Egbe and Mbu (2016), considered short term effect on child health status in general. Other studies have also examined child labour on health status using an objective assessment of weight-for-age (O'Donnell, Rosati & Doorslaer, 2005) and body-mass-index (Beegle, Dehejia & Gatti, 2009). Results obtained were mixed or indeterminate for which drawing conclusions becomes difficult. In addition, their models are limited because they ignored the scrutiny of endogeneity of child labour and estimates could be bias. Studies on health is very difficult to assess and therefore the use of anthropometric measurement like the body mass index (BMI) is the objective approach of health assessment, however, they also have their limitations.

One important drawback in these indexes (for instance, BMI) is the fact that it measures the nutritional status and general fitness of the individual rather than the specific physical health injury occurred during labour activities. In this empirical paper, self- reported health assessment is more preferred because it is a good predictor of present and future mortality and as such subjective measures should not be regarded as ad hoc measurement (Idler & Benyamini, 1997). Thus, it has the potential to identify the direct effect of child work as it may cause adverse effect on human capital formation. Distinct from other studies, the study incorporates heterogeneity nature of health status and well as considering child labour as a choice variable which is likely to increase the robustness of our findings.

Finally, the aforementioned arguments give the impression that research work exist on child labour, but there are more to be done and it is of paramount importance that this economic phenomenon receives attention needed to implement policies to curb the situation. Therefore, the above questions are not clearly known and in view of this, the study model the extent of parental attitude to supply child labour and how it affects child human capital formation in the public basic schools in the Central Region of Ghana.

Purpose of the Study

The main purpose of the study is to investigate the extent of parental attitude to supply child labour and how it affects child human capital formation in the public basic schools in the Central Region of Ghana.

Research Objectives

Specifically, the study sought to:

i. assess the effect of parental attitude on child labour participation.

ii. estimate the effect of child labour on educational outcomes.

iii. determine the effect of child labour on child health outcomes.

Hypothesis of the Study

In relation to the purpose and specific objectives raised above, the study tested the following hypothesis:

i. Parental attitude towards child labour has no significance influence on child labour participation.

ii. Child labour have no significant influence on educational outcomes in terms of school attainment and cognitive skills ability.

iii. Child labour have no significant influence on adverse health outcomes of the child.

Significance of the Study

Although some studies have been done on child labour and human capital formation around the world, there is still the need to conduct an inquiry that would provide constructive information in assisting government and stakeholders to rethink strategies of curbing the economic challenge. The research would provide government adequate information to target vulnerable households, especially children from poor households engaged in fishing and its related activities, as part of poverty reduction programme.

Furthermore, child labour-human capital trade-off seems to be a threat to the SDGs for achieving universal basic education because basic education system is the core for national development. The research information is likely to help the Inspectorate Division of Ghana Education Service to establish an integrated child labour inspection system to monitor school attendance in order to check absenteeism and school drop-out in the Region.

Following the assertion that children are the asset to the future generation, it is therefore, imperative for children to develop their full potentials. For that matter children have right to education and good health for future development, hence, it becomes unlawful for a child to work (Children's Act, 540). Tremendously, the research findings of the child labour and human capital formation in the Central Region would bring to light adequate knowledge for the Children's Act to be enforced and made operational in order that perpetrators of child exploitation would be dealt with accordingly as the law demands.

Lastly, the findings would also bring to light valuable information that would equip programme planners and policy makers such as the Ministry of Employment and Labour Relations, Ministry of Gender, Children and Social Protection and Non-governmental Organisations to support for the effective coordination and monitoring of the child labour elimination programmes. Thus, the information would anchor these stakeholders to institute strenuous child labour prevention mechanisms, child protection laws and law re-enforcement measures to curb the situation.

In addition, the study would contribute to existing body of knowledge, relevant for researchers and the academia. It is hoped that the research findings are intended to set the stage for future research in other regions in Ghana, so that the broader picture of the situation could be well addressed.

Scope of the Study

The study covered only the fishing communities in the Central Region that lie along the coast. It is fenced around children who are currently schooling from kindergarten to junior high school. This was chosen due to the fact that, the key development issues concerning universal basic education appears to be

under threat in the coastal communities because of the high incidence of children in worst forms of child labour (GSS, 2014).

Furthermore, the age bracket is 5-17 years, because this is the age that is considered as a child (ILO, 2013a) and it is unlawful for any child to work at the expense of schooling and health (Children's Act, 1998). Therefore, at least one of the following categories defines child labour in this study context: children engaged in economic activity in line with fishing and its related activities, or fishing work designated to be hazardous established by National Legislation.

Definition of Terms.

Child Labour (Participation): Children between 5-17 years who at least falls within one of the following categories: engages in economic activity in line with deep sea fishing and its related activities, or fishing work designated to be hazardous or having hazardous working conditions established by National Legislation, or engaging in economic work in fishing activities for at least one hour.

Child labour-human capital formation trade-off: Children engaged in economic work (fishing work) and its negative effect on schooling and health outcomes.

Cognitive Skill Ability: An educational outcome which measures the average intellectual development of the child when schooling in terms of test scores in Mathematics, English Language and General Science.

Educational Outcomes: Indicators of grade-age attainment and cognitive skills ability.

Hazardous Work Activity: Children working in designated hazardous work or designated hazardous environment or conditions such as handling sharp or pointed tools and chemicals, exposed to fire, gas, fumes, height, noise, poor ventilation, in the referenced period of the study.

Intensity of Work: Quantitative hours of work performed by children who engage in deep sea fishing and other related activities.

Night Work: Children working within 8pm-6am hours.

Over-aged in Grade: Children who are at least one year older than the official age in current grade of schooling calculated by Psacharopoulos and Yang (1991).

Parents: Not necessarily biological, but an adult whom the child is under his/her care: provide shelter, food, clothing, education, health and other welfare issues.

Normal-aged in Grade: Children who are at or younger than the official age in current grade of school calculated by Psacharopoulos and Yang (1991).

Schooling for Age: Measures schooling attainment relative to age, taking into consideration the official entry age and current grade in years multiplied by 100%.

Organisation of the Study

Chapter One provides an introductory overview of the whole study comprising introduction, background information, statement of the problem, purpose of the study, research objectives of the study, significance of the study, scope of the study, definition of terms and how the thesis is organised. Chapter Two reviews the relevant literature on situational analysis of child labour and the overview of the Basic Education Service in Ghana. Chapter Three also

reviews both theoretical and empirical theories that underpin the research work. Chapter Four is the methodology which is in two folds. The first part gives the description of the research design, the study area, sampling procedures, data collection and ethical considerations. The second part presents a detailed overview of empirical framework, measurement and estimation for each empirical objective. Chapter Five assesses parental attitude and child labour. Chapter Six examines the effect of child labour on educational outcomes, which includes grade in age-adjusted school attainment and cognitive skills ability. Chapter Seven also focuses on the implications of child labour on health outcomes. Chapter Eight summaries the major findings, conclusions, policy recommendations, limitations and areas for future research study.

CHAPTER TWO

OVERVIEW OF CHILD LABOUR AND BASIC EDUCATION SYSTEM IN GHANA

Introduction

This chapter presents an overview of child labour and the basic education system in Ghana. The first section reviews the trends of child labour involvement for ages between 5-17 years group. The review basically relies on report of Ghana Living Standard and Survey (GSS, 2014 & 2019), the International Labour Organisation (ILO, 2013; 2017 & 2018) and Children's Act (1998). It highlights on its characteristics, focusing on children in fishing related activities and concludes with the various legislative frameworks in place to minimise and combat the economic challenge. The second section also reviews the education sector in the context of basic education in Ghana.

Situational Analysis of Child Labour in Ghana

Child labour refers to children (5-17 years) in employment or those engaged in any economic activity (at least one hour) that is likely to interfere with their education opportunities, potential, dignity and harmful to their physical and mental development. In the extreme cases, child labour encompasses children being in bondage or servitude or serfdom or exposed to commercial sex work, illicit drugs, working in bars or hotels. In view of these broad definitions, by context, what makes a child labour depends on child's age, nature of work, hours of work performed and how it impacts on academic work and health. However, there are cut-off points of age under which a child can enter into the labour market, and these include:12-14 years permitted to work under conditions which do not hinder any of the aforementioned effects; or 15-

17 years in hazardous work only under strict supervision. Therefore, by educational policy, compulsory age of schooling begins at 4 years and by 15 years the child would have completed junior high school (JHS). While acknowledging this fact, however, 12 years and beyond can work under supervision, otherwise it is child labour.

Child labour is a global phenomenon and over the years, millions of children between 5-17 years of age are actively involved in economic work and Ghana is not excluded. The child labour report estimated 8,697,602 million children and out of 2,476,177, 28.5% of children in this age group were considered to be working and 21.8% are in child labour (GSS, 2014: 39). Again, 14.2% are into hazardous activities whilst 7.6% are found in other activities. Currently, working children of 5-14 years stand at 29.2% (GSS, 2019:106).

The Child Labour Reports show that child's age has an increasing effect on child labour, based on the fact that persons productivity increases along-side with age, there is also increases in the indirect cost of education. The proportion of children in employment is 43.7% among 15-17 years and 10% for 5-7 years (GSS, 2014: 57). Notwithstanding, there is discontinuity of age as it falls slightly from 12-14 years. This may be attributed to the cut-off point of age which excludes children in light work (ILO, 2018). As regards to gender dimension, the proportion of males is not significantly different from that of girls. Perhaps, because of exclusion of domestic work such as household chores, where girls are predominantly engaged. Boys engaged in child labour is higher than that of girls. For example, the GSS (2019) reported that between 5-14 years, the girls are 27.5% compared to 31% for boys (p.106). Previous report of the GSS (2014) also shows the same pattern and girls account for 27.9

percent against 29.2 percent for boys (p.57). This could be deduced that females are less likely to work than boys.

This economic challenge is prevalent in all the regions of Ghana with particular emphasis in the informal sector for which children carry out varied forms of economic activities ranging from services, agriculture (including fishing, crop farming, animal farming and forestry), quarrying and small scale mining. There are also regional variations of child labour involvement pointing to specific geographical proxy. The Upper East Region stands out with 98.4% of children mainly in farming activities. This follows up with Upper West Region of 86.2% children. The two coastal Regions of Central (83.2%) and Volta (82.4%), children are mostly in fishing activities. The Brong-Ahafo and Northern Regions account for 81.7% children, respectively. Mining and cocoa farming activities are predominantly engaged by children from Eastern (75.6%), Ashanti (72.4%) and Western (67.8%) Regions. Lastly, Greater Accra Region also constitutes 7.9% child labourers (GSS, 2014). Some descriptions of activities include: head porterage, weeding, scooping beans and drying of cocoa pods, plucking and carting fermented cocoa beans, paddling canoes, pulling long and heavy loads, carving canoes, diving into deep waters to track fish movements or disentangle fishing nets from tree stumps, picking and sorting fish, marketing/petty trading, mending net and hustling for fish.

In performing the economic activities, children are engaged in strenuous, demanding and more hazardous conditions of work accompanied by long hours that expose them to high risk of contracting diseases and injuries which are likely to have serious human capital implications (ILO, 2018). Children in fishing related activities are noted to fall under the hazardous or better still worst

forms of child labour category. Although, not all fishing related activities may be hazardous, the implications of the nature of activities and hours of work are significant, multidimensional and universal concern given the venerability of children and the subsequent education and health challenges that are possible to occur during working period. Children are engaged in every stage of fishing activity: production and sale of inputs, actual fish catch, fish processing, marketing/distribution, upstream jobs and other related duties. Given the specific activity, children are sometimes exposed to toxic chemicals, fire, gas, vibration and fumes, causing occupational hazards and diseases such as tuberculosis, difficulty in breathing (hypoxia), eye irritations, burns, lung infection, increased attention deficit, hyperactivity disorder, neuro-behavioural and pulmonary cases. Other diseases include skin diseases, fracture, fatigue, fever, insect bites and dislocation of joints (GSS, 2014).

In light of working period, children work for long hours throughout the days of the week between 6am-6pm and even beyond. The GLSS-6, noted that children between 5-17 years work average hours of 14 hours per week and a maximum of 43 hours. The hours of work mirrors that of GSS (2019); which indicates that children still work for long hours with majority (94.4%) of them working up to 40 hours, and male children working more hours than girls. Accordingly, the ages under which children work is out of the boundary set by the Ghana Labour Act. In addition, Children Act and Education Act discourage children from being engaged in night work as well as working for long hours. Yet, children work as long as 42 hours per week, thus increasing the risk of health defect as well as hindering children's educational enrolment and

attainment, and subsequently eroding the human capital needed for economic growth.

Schooling and child labour involvement are two mutually exclusive events for which one interferes the other's success. Considering this fact, child labour becomes an impediment in achieving universal basic education objectives. Indeed, child labour is deemed to lower school life expectancy. Years of schooling decreases with respect to age as satisfactory proportion of children drop out from school prematurely. It remains significant as it interrupts the upper end of the compulsory school age spectrum. Reasons for not attending school were both supply and demand side factors. Geographical location of school, cost of schooling, parental withholding or negative attitude towards children's schooling, stress associated causing lack of interest in schooling and learning were some reasons sometimes expressed.

The analysis of various Reports concerning child labour in Ghana, depict an adverse effect on human capital formation, both present and future. In order to minimise this economic phenomenon, policies and programmes such as, the Fisheries Act, Fisheries Regulations and other legislative instruments highlight national response to uplift the welfare of children from worst forms of child labour and trafficking in Ghana. The Government has made tremendous effort through international platforms such as United Nations Convention on the Right of the Child with two protocols: ILO Convention No. 138 and No. 182 of minimum age and worst forms of child labour, Africa Charter on the right and welfare of the child of addressing the problem. Other international protocols are the abolition of forced labour convention No. 105, United Nations Standard minimum rules for administration of juvenile justice and the ILO

Convention on Labour Inspection No. 81 have been domesticated through the Ghana National Constitution and National Laws to execute their mandate. The implementation of free and compulsory basic education was also a strategy to eliminate child labour in Ghana.

The author's position is that child labour remains an economic challenge and an impediment to basic educational goals in Ghana. Although, children participation in labour gives them first-hand employment and contributing to household income, the conditions under which these children work must not be overlooked. Indeed, there are a number of legal frameworks aimed at minimising child labour in Ghana, and apparently much is required at the micro level to enhance its proper functioning. Since basic education remains free, the institutions need to be strengthened to provide the requisite framework to foster the achievement of the sustainable development goals.

Education Sector in the Context of Basic Education

Education is one major key element of human capital accumulation through which labour embodiment is achieved and desired employment is gained. Its establishment is intended to produce well balanced individuals with the requisite knowledge, skills, values, aptitudes, customs and attitudes to become functional and productive citizens for total development and democratic advancement (Acheampong, 2009; Kuyini, 2013). For that matter, it is a vehicle for economic transformation both at the micro and macro levels. Over the years, the various political regimes since 1950s to date have put education on high agenda of all development plans to boost educational attainment (Little, 2010). All these political regimes committed themselves to providing universal basic education for all. The increased demand for education

arose owing to the fact that it is a basic human right and a means of liberating people from old ideas, a sine quo non for economic growth.

According to Graham (1976), the first to make basic education a policy priority after the colonial educational policies was Dr. Kwame Nkrumah political administration in 1950s and 1960s, respectively through the implementation of the Accelerated Development Plan of Education. Acheampong, Djangmah, Seidu, Oduro and Hunt (2007) emphasized that the plan placed much emphasis on fee-free basic education, which led to rapid increases in gross enrolment ratios (GER) in the primary schools. The philosophy that underpins the basic education policy was access, equity, quality and relevance.

In the 1970s, the situation changed and educational standard began to decline. The downturn of enrolment pattern was due to economic decline which obstructed negatively on basic education delivery, especially in the late 1970s and early 1980s (Colclough, Lewin & Chriswick, 1993). This was followed by attacks which described education as "ill-digested series of proposals based on political expediency". One key lapse was the invasion of pupil teachers, leading to low academic standards. Another setback, was the brain drain of professional teachers, inadequate educational materials and financial stress on educational expenditure. During these eras, basic education was 10 years of schooling, consisting 6 years of primary and 4 years of middle schooling, making it 6-4 educational structure. Thus, the child entry age of schooling was 6 years old.

At a swift moment, immediate attention was put in place and the Junior Secondary School Programme was launched in 1987, and targeted access, vocational and technical content, and cost recovery to increase efficiency. The reforms phased out the existing Middle School Leaving Certificate (MLSC),

thus, reducing schooling attainment to 9 years, making it 6 years basic and 3 years junior secondary school. Gross enrolment increased substantially across all regions. For example, between 1987 to the early 1990s, the enrolment rate increased from 76% to 79%, but decreased to 73%, increased again in late 1990s (Thompson & Casely-Hayford, 2008). In fact, during the years, the pattern of enrolment growth could be described as inconsistent. The new reforms were also beseeched with challenges such as limited access, poor quality of teaching and learning, inefficiency, quality, decentralisation and lack of involvement of stakeholders especially, parents.

Following the challenges that envisaged the 1987 reforms in an attempt to find solutions to access, content, quality and educational infrastructure development, Acheampong (2009) noted that another 11-year period of educational structure, from 1996-2000 was launched which emphasized free and compulsory basic education for all children between the ages of 4-15 years. Now, the 6 years entry age replaced 4 years entry age for schooling, for which Kindergarten was incorporated making basic education structure as 2-6-3. A major motivation for the free Compulsory Universal Basic Education (fCUBE) was the recognition of gender equity, for that matter low enrolment for girls is an indication that their future economic, political and social empowerment is trembled upon (Donge, 2003; World Bank, 2004). The reform was philosophised as the socialist ideology, basic education for all and practical skill training.

The 1996 reform was also thwarted with some bottlenecks in achieving the objectives. Quality concerns were the major challenges besides overage children in school. In 2002, presidential committee on education was set-up to

review the previous programme in the Kuffour Political Administration. The number of years was maintained at 11 years, for which 2 years kindergarten, also termed as early childhood development was the attention. A new curriculum also emphasised on quality, Information Communication Technology (ICT) and access to education. Hence, the educational structure became 2-6-3 years of schooling. Many initiatives were introduced to boost school enrolment, and these were capitation grant, school feeding programme and free distribution of exercise books. According to Adu-Gyamfi, Donkoh and Addo (2016), the policy of abolition of school fees in the form of capitation grants to various basic schools hiked enrolment by an impressive rate of 14.5% and early childhood schools were significantly over 36%, respectively. Specifically, primary school gross and net enrolment rose up to 92.4% and enrolment of girls (18.1%) increased slightly more than that of (15.3%). boys

Another initiative that contributed positively to the increase in school enrolment is the school feeding programme. According to the Annual Operation Plan 2007, the enrolment level increased in many public basic schools where the programme was operating. The free distribution of exercise books also reduced the direct cost of education for parents and guardians. By 2010, gross enrolment rate at the basic education level remained at 95%. Current available data show that 48% of children have achieved basic education and 28.5% children are out-of-school (GSS, 2014). This shows a continuous improvement and skill development through basic education.

Indeed, the various educational reforms have gone through many reviews to explore ways of improving access, quality and resources to achieve the objective of Education for All agenda. However, educational expenditure

continues to increase, covering the largest share of government expenditure of 76% of all funds (GOG, 2018). In this connection, the educational attainment of this laudable goal, however, continues to be plagued with poor basic education delivery. It must be emphasised that quality basic education is a complex multifaceted concept which embraces physical infrastructure and conditions, learning resources, teacher development/professional competency, students' academic achievement and poor community participation. Therefore, quality education service delivery demands efficiency in making the best possible use of available resources to meet educational goals (Adu-Gyamfi et. al., 2016). Efficiency analysis which includes both cost effectiveness and cost-benefit analysis provides information for policy makers to improve utilization of available resources to its optimal use.

The review of basic education in Ghana was seen as a right and fundamental pre-requisite for human capital accumulation. Based on the motivation, the basic education has gone through several equity-improving policies and enrolments have improved tremendously over the past years of successive governments. It is mandatory of parents and guidance to enrol and keep the child in school in the eleven-year period. For that matter Government must also tackle quality issue, in terms of school attendance, infrastructure and learning resources. Throughout the discussion, several reviews of education reforms did not mention any school attendance policy attached to the compulsory schooling. Hence, economic growth could be successful if private and social returns to education in terms of school attendance, transition rates, completion rates and academic performance of pupils at the basic level are recognised and monitored.

Chapter Summary

The chapter reviewed the state of Child Labour in Ghana and various reforms in Basic Education system delivery. From the discussion, it is clear that education is widely regarded as a route for economic prosperity and technological advancement. Therefore, the incidence of child labour and the nature of work should not be grossed over. Education constitutes a linchpin of our development, and as such the system of focusing on enrolment drive needs to be considered to include policies on school attendance. Various legal frameworks exist and as such the cost of inaction seems clear.

CHAPTER THREE

LITERATURE REVIEW

Introduction

The literature focuses on the accumulated theories and empirical reviews already established and gaps in place that needs to be bridged. Hence, the literature is reviewed in accordance with the research objectives on the following broad headlines, namely; historical overview of child labour, theoretical literature and empirical literature: educational attendance, school attainment, educational performance and child health outcomes.

Historical Overview of Child Labour

Child labour has been in existence since the pre-industrialisation era. The era witnessed textile and mining productions in Western Europe and United States, when large-scale production was a mirage in the 1830s and child labour was the main preoccupation for households. Britain, Belgium, France and United States were also among the countries in the early industrialisation period. Against this background, these countries involved children intensively in their process of industrial revolution and incidence of child labour was quite high in the 1860s (Horrel & Humphries, 1995). Horrel and Humphries noted that in Britain, more than quarter of children's population below 18years represented the workforce. Relatively, labour participation rate of children between 10-14 years were 36.9% for boys and 20.5% for girls. In France for instance, 12.1% of children under the age of 16 years were French workers. Apprenticeship and learning-by-doing was the order of the day for early labour market participation. Children involved in the apprenticeship were very happy as it is expected to yield high returns for their household, as such parents

considered the training as high-class kind of investment compared to "pauper apprentices" which does not demand much investment from parents. The 'pauper apprenticeship' dominated in the rural settings and one key purpose was for household subsistence survival. Not surprisingly, regularity to school at that time was very low because of family withdrawal from school to join apprenticeship training (Coombs & Radburn, 1995). This shows and signals that child labour is incompatible and a hindrance to educational outcomes.

Accordingly, Humphries (2012) noted that children economic contribution was very important in the household budget set, and parents' commitment to child's school was less valued. The importance of child labour was also well noted in other sectors such as agriculture, miscellaneous manufacturing and services. In agriculture, the commonest specific activities children engaged were bird scares, shepherds, ploughboys and farm boys. As regards to textile manufacturing, winding bobbins and hand loom weavers were predominant among child labourers. Concerning services, boys were employed most to run errands, delivering mails to officers, messenger boys, working in shops and rural -water driven mills. However, domestic work remained foremost for girls in the 19th century (Connick-Smith, Sandin & Schrumpf, 1997).

Besides the industrial revolution, between 19th to 20th centuries, the focus of child labour participation shifted from quantity of labour to technology-based labour (Nardinelli, 1990). That is to say that, some specific jobs demanded the skill and effort of children. This justifies the 'nimble fingers' hypothesis argument of child specialisation field of work. In light of the nimble finger hypothesis, the work of machines was replaced by children specific tasks. Steam power allowed only children and women to be engaged as it was

previously done by men. The narrowness underground passage of wooden textile machinery also demanded the skill of children.

Unquestionably, as a way to reduce labour cost, the early constructed machinery was designed purposely to be used by children. The technology use and labour varied significantly across industries. Some firms used technology with child labour and adult labour in the same industry. In Ghent cotton industry, for example, women and children were recruited to form the labour force. In this vein, technology was not only that determines child labour but, employment strategies, industrial organisation and strength of labour organisations. Also, Goldin and Sokoloff (1982) argue that, in Northeastern United States, industrial organisation had influence on the demand of female child labour. Therefore, females and children were the predominant labour force in the various industries. Manufacturer's strategies also increased child labour as they engaged children in military services in Britain, France, Russia and Australia.

The historical perspective of supply of child labour is traced from family strategy, where the family is viewed as taking decision in the interest of all. Interestingly, Sen (1985) noted that parents were assumed to have exclusive control concerning the welfare of their children or otherwise. The altruistic behaviour is explained in Humphries (2012) who observed that it is only selfish parents who put children in labour to reap the benefit before their death. Altruistic parents therefore, send their children out to work because of household insolvency for that matter cannot borrow against future earnings. If parents decide to borrow for human capital and survival, borrowing rates that are higher than the lending rates would shift schooling in favour of child labour,

for the parents to receive income early in life. Goldin and Parson (1989) posit that high demand for child labour reduced the future wealth position of children. Child labour had definitional negative effect on schooling attainment in the United States in the 19th Century when children were intensively involved in the industrial revolution. Humphries (1981) noted that many children attended school irregularly and greedy parents did not care at all, thereby using child wage to buy goods such as alcohol or tobacco. In fact, the further the historical analysis of child labour, the lower the child care. Children into labour were perceived to be treated as badly to the level of sexual abuse, molested, terrorised, and its extreme case death in some instances (Badinter, 1981). Also, according to British Parliamentary Papers (1968: 338) as cited in Basu (1999), children worked for long hours, frequently beaten and were paid a pittance or mite. Thus, sending children to work at an early age generates less opportunity to accumulate human capital.

Strengthening the above point, however, Horrel and Humphries (2018) mention that mothers were seen as very caring relative to fathers. Indeed, child labour was extensive in the pre-industrial countries, where wives pursued domestic roles and fathers experience short-term unemployment. Based on this premise, mothers contribute to family income than fathers. Irrespective of the work that wives involved themselves, mothers were not seen as consuming their early benefit of their children's labour, unlike fathers. Children's income went through recycling through the household accounts and mothers ensued this course. In addition, being with no father had large influence on the start of work at early age, encouraging child entry into the labour market (Humphries, 2012). Household size also played a role in the industrial revolution. Britain

industrialisation witnessed growth in population, raising the dependency ratio, and that advanced to young children into the labour market.

The role of the state was not left out in the history of child labour. The State put measures in place to decrease the children in early labour market participation as compulsory schooling was encouraged to limit child labour. Weiner (1991) notes that both the European and non- European countries saw decline in child labour as the introduction of compulsory schooling was prioritised. In addition, labour participation rate of children between 10-14 years and younger declined when the compulsory schooling was introduced in Britain in the 1870s. The educational subsidies rather than welfare subsidies were very successful as a regulatory policy to curb the incidence of child labour in the revolutionary period. Charity schools, Sunday schools, free schools for poor children, part-time or seasonal schooling, reading rooms and mutual improvement societies were all state strategies of controlling child labour in the 19th Century era.

One major comment concerning the early emergence of child labour is lack of proper definition. The major critique is that the literature failed to measure child labour, particularly in areas where it was prevalent, such as family farms and family businesses. The intensity of how their employment status affected their entire life in terms of education was not well documented. However, the historical perspective of the incidence of child labour in the 19th century during the pre-industrial period particularly in Britain resembles what pertains today in the modern economies. Historians found that household insolvency was the main determinant of child labour supply. Family strategies, cultural context, the role of the state and capitalist labour market were also

independent factors that explained the increasing rate of child labour and thus, currently remain the factors that control child labour in Asian and African countries, particularly Ghana. Children still remain an important labour in the informal sector mainly in agriculture, mining and services in Africa and Ghana in particular.

Theoretical Literature

Educational Production Theory

The educational production theory presents a fundamental analysis in line with the key concepts of the production of the firm. Comparing education and a firm, the firm is considered the economic agent that combines and transforms inputs to produce goods/services or output to satisfy the consumer's wants. Land, labour and capital are the conventional inputs in the production process and the end result is the output. In this regard therefore, the educational production function is valued in terms of inputs and outputs. Therefore, the school is likened to be a firm that transforms the child into a more useful commodity. Such inputs are school plant, materials resources, time, human resources and family attributes, put into skills that are embodied in students. Thus, the household decision of sending a child to school with the expectation that the educational process would transform the child into embodied skills and knowledge is essential for growth and development. The attendance, attainment, achievement and future job prospect of schooling based on superior market value is viewed as output. Hence, the production theory of education has a great deal of validity, in the sense that it conceives education as investment and at the same time a consumption (Becker, 1993; Hanushek, 1995).

The distinction between physical capital and education is that physical capital can be resold in period of recession, but education is embodied in humans which could be acquired at the beginning of individual life and as such the parents are the investing agents. The human being is not consumed during the production process, because the human being remains untransformed but, some sort of attributes like acquired skills get transformed during the process. The most important similarity exiting between physical capital and education lies to the point that marginal productivity equal marginal cost. Yet, it does to exclude itself from being risky like any other investment.

Furthermore, the education theory assumes that human beings cannot be collateralised, except the circumstance of slavery. For that matter, it opens up to market failures, which are absent in the case of physical capital. While cost of borrowing could be eased by collateral, it is impossible to offer knowledge and skills as collateral. There is also the possibility of moral hazard behaviour which is more prominent in the case of education as a human capital. The cost benefit of education accruing from the future, is conditional on exerting adequate effort in the labour market, however, the impossibility of checking for future effort render it non-contractible. The owner of the physical capital is the capitalist in contrast to human capital as wage earner or dependent worker (Cheechi, 2005).

The determinants of educational choices as an investment is very simple and as such the household plays a key role in achieving the educational objective. The household is therefore, faced with budget constraints that include time and income generated from market activities. As household invests in education, two time periods emerge, investing and yielding returns. Parents have

expectations as regards to private returns to education based on the marginal productivity provided by the prospect of future lifetime gains and cost involved in child's schooling. The gains of the educational process are the enrolment rate, school attainment and achievement at the end of a particular time period of schooling. Enrolment rate is measured by accounting the number of students who have been registered in school. School attainment is the level of educational ladder reached. Achievement is the yearly results obtained at the end of each level of education.

The household cannot demand for education without incurring cost. The cost of education rests on direct and indirect (opportunity cost) expenses in the household. The expenses from tuition, feeding, transportation, educational materials, time spent on school work (both school and home), clothing and other additional costs. The opportunity or indirect cost is the present earnings forgone in place of schooling. Therefore, the demand for schooling is viewed to be the function of the characteristics of the household in the first instance. For example, family income or wealth determines the choice of investing in education. The indirect cost is subject to the labour market opportunities open to the individual. If human beings are considered as production input, then the returns to education from profit maximising firms corresponds to marginal productivity (Cheechi, 2005).

Todaro and Smith (2006) conceptualized that the years of schooling by an individual, is largely determined by demand and supply forces just like any other commodity. Thus, educational production theory simplifies education as a commodity. The household's demand for education is a derived demand based on the future earnings of the child. Human beings attend school because of the

enjoyment derived from acquiring knowledge and as such high wage employment opportunities. In view of this, the theory of consumer behaviour, underpinned with utility maximisation assumes that the optimal demand for education would equate marginal utility of an additional knowledge acquired to the disutility of renouncing alternative uses of the time involved.

However, the amount of schooling demanded sufficiently for economic development appears to depend on the taste for schooling within the household and is in relation to other variables such as race, religion, occupation, region of residence, social status, education of parents, family size, gender, birth order, innate ability and cultural values. All these variables, and the most important being the parents' education attainment, have higher expectations regarding child's schooling and for that matter influences the returns to formal schooling. The choice of education is faced with constraints and opportunities in the labour market that are likely to impact on household demand for education.

The supply side of education, is highly empowered by policy environment, responsible for supply of educational services. Curriculum, funding, labour laws, certification, hiring of labour particularly, teachers affect the operation of the school and thus, household demand for education. Hence, the household demand for education is an expression of inputs and output variables discussed above of the form $R = f(x_1 , x_2 , x_3 , x_4 \ldots)$, where R and X_s are the outputs and inputs of education.

Human Capital Theory

The concept that investment in human capital promotes economic growth dates back from the time of Adam Smith; the Wealth of Nations, who emphasised the importance of investing in human beings in 1770 (Glewwe,

2002). He stressed that labour market depends on knowledge formation at all levels of education, particularly at the start of basic level. The human capital theory of education also reflects the synthesis of health, a key component of an individual welfare and standard of living.

Recent economists have also recognised the integral part of investment in humans. This emerges clearly from key economists of the Nobel laureate Gary Becker and Amartya Sen, Schultz (1961), Mincer (1974), Poulson (1994), Psacharopoulos (1994), Grossman (2000) and Checchi (2005). The authors emphasised the value of human capital as a factor of stimulating household gains in their productivity in market and non- market activities. This is because schooling and health are unique set of abilities that become embodied benefit of the individual and society. Therefore, in the first instance, schooling is worth, since more education is associated with higher expected earnings in one's adult life. Analogously, stocking in health may also increase individual productivity and earnings and improve lifetime utility (Grossman, 1972).

Following Becker (1993) in the context of education, households may divide or share their total spending according to the number of children and amount spent per child, which is negatively related. This is because, an increase in family size raises expenses on one additional child, implying a negative relation between high fertility rate and human capital accumulation. Indeed, small families spend much less and typically rise faster and further in schooling hierarchy than other families.

Investing in education does not involve only material resources, however, time use devoted by the family involvement in schooling is basically essential in the educational production process. Accordingly, Guyan et al. (2008) notes that the

consideration of the family is qualitative and quantitatively important input into the educational production function. Parental time is the home input related to the overall quality of the home environment. Patacchini and Zenou (2011) add that 'identity' to parents' utility level act as self- image of ideals and the characteristics of the parents. With these preferences, parents investing effort to get involved in their child's education derive utility through the effect of their investment on the child's education success. School to home and home to school communication,, assistance in learning activities at home, involvement in school decision making, governance and advocacy, collaboration and exchange with community organisations are the inputs from spending time with child education. Thus, utility derived from children takes several forms, however, spending time with child's education is a form of investment in human capital. Accordingly, motivated and better prepared children by the household over their schooling pave way for children to learn more easily.

Education as a Commodity

The first conception about education is viewed in terms of a commodity. The human capital theory regards education as providing higher social status, and therefore individuals attend school in order to increase the esteem they obtain from other people or society (Fershtman, Murphy & Weiss, 1996). Furthermore, individuals demand education because they enjoy acquiring new knowledge. Accordingly, Glewwe (2002) notes that education carries prestige to a particular level of attainment for which society gives recognition, which may enable the individual to find a better job or even a better spouse. The famous conception of utility maximisation envisages that optimal demand for

education equals the marginal utility of additional knowledge acquired to the marginal disutility of renouncing alternative uses of time involved.

The contribution of Lazear (1977) points out that education is simply a commodity just as any normal good for consumption. As such for any normal good, an increase in wealth increases the amount of attainment levels of schooling, and increased in earnings are linked with higher attainment of schooling. In view of this, education increases wealth only by the consumption value of the good, because education is a public asset. Schultz (1963) concludes that the utility derived from acquiring knowledge, both present consumption component, a future consumption component takes into accounts that, education improves the ability to consume other goods in life.

Education as an Investment

The second conception look at educational choice as investment decisions where current income opportunities are renounced in exchange for better prospect in future. In simple terms, there is monetary gains of investing in education. In the previous literature, it was noted that individuals attend school because of acquisition and broadening of knowledge. The acquisition of knowledge would be attained optimal in such a way that marginal returns equalize marginal cost. The pioneering works of Becker (1964) explained education as investment in analogies to physical capital, where marginal productivity equates its user cost. The only difference is that education is embodied in human beings whilst physical capital in invested in machineries. The author emphasized the relevance of education to individuals and to the society. The role that education plays is seen in a broader context of both microeconomics and macroeconomics that speculate the educational

contribution to economic growth. Though, this remains an analogy, since the firm maximises profits, the embodiment of human capital is thought also to increase workers' productivity and future earnings.

Investment in education is analysed in the economic theory of the household. The household decision making particularly, on the child's education is subject to budget constraints that include time and income generated from the market. For that matter, education plays a critical role in preparing individuals through equipping them with the necessary skills and child's future life time earnings, for which portion goes into parents' utility and the child's utility as well. As such parents are assumed to maximise the household utility function given the budget constraints. Theoretically, parents desiring to invest in their children's education depend on child characteristics, household characteristics and government policies.

Human capital is embodied in humans in early life, and how it is acquired to enter the labour market successfully is determined by educational outcomes that may generate income prospects in the future (Psacharopoulos, 2006). The life of an individual is of two periods; childhood and adulthood. In the first period, parents make decisions for at least a child in the household and maximise utility function from the returns of the child. In such a case, the parents have a choice for the time period of the child; either schooling, work, or both. In line with the current economic literature, any current investment in education is encountered by risk, just as the firm, and that parents may like to diversify their investment among alternatives, such as reaping future returns from the first period (Cheechi, 2005). That is to say that acquisition of

knowledge is not instantaneous, but time and effort are needed to execute its function.

Educational outcomes according to human capital literature start at basic level, that the individual attains the basic skills at the beginning of life- long learning (Sen, 1985). Spence (1973) claimed that education enhances a person's skills and leads to higher productivity and wages. The first tier-linkage is the demand side factors that influence educational choice from the child, family and societal characteristics (Fasih, 2008). The child's innate ability, socioeconomic background of parents and parental taste for education influence household decisions on education. Supply factors are the school characteristics and other input necessary for quantity and quality educational system (Glewwe, 2002). On the other hand, government influence how these determinants work in the educational system. The government generally has considerable authority over areas such as school facilities, curriculum, methodology of teaching, material resources, and many other factors, which these interact and control household choice of investing in children education.

Indeed, the second tier-linkage of human capital accumulation, is the educational outcomes which interlinks with individual, household, community, school characteristics, quantity and quality of education received. Thus, quantity and quality of the education (including the curriculum of education) in the investment period cumulate into time spent in the education system and the type of education (general or vocational education) received over the years. The years of schooling and the quality provisions in the educational system lay a good foundation and function as signal to the individual which possesses useful skills and knowledge to perform effectively and efficiently in the labour market.

Economic literature of Cheechi comments that the investment in educational production function incorporates students' abilities, schooling resources and cultural environment to produce human capital formation. Educational resources devoted to schooling foster longer school attendance of students and subsequently higher school attainment that induce human capital formation. Educational resources such as libraries, quality teachers, school plants, recreational facilities encourage students to remain in school which increases attendance. Therefore, human capital is produced when more resources are invested in schooling. However, it is risky for parents and as such they can overcome when motivated by their taste for schooling. Therefore, the higher the risk or investment, the higher utility is generated from educated child (Glewwe, 2002).

Health as an Investment

Basically, health as an investment has been inspired by Grossman (1972, 2000). Theoretically, the decision of the household to demand health is just like education. The important issue is that human beings can be considered as stock of capital. As such, capital needs investment. Therefore, households decide to invest in health of their children because that capital stock is expected to influence the physical and mental development of the child in order that ill-health is less likely to block the full potential of children. Thus, stock of investment in health has long life effects on the child productivity and welfare. In other words, human capital theory explains the value of health to the socioeconomic development of individuals in the society and the nation as a whole. The optimum outcome from parental investment in health is up to the

point where the expected benefit would be equal to the cost, or where net present value of such investment is zero (Becker, 1964; Grossman, 2000). Modelling investment in health is a way of households combining purchased inputs and time to augment the health status of their children. However, such an investment is not easy to measure, let alone the differential earnings that accrue to such investment in the market place (Poulson, 1994). It is an established theory that demand for health is direct to the relative cost of health inputs. This implies that health status is likely to improve productivity, increase efficiency and quality of life given the family characteristics. Therefore, stock of health has increasing effect on wages. In fact, human capital investment analysis in health and education are unified (Becker, 1964, Grossman, 2000, Schultz, 1963).

In making reference to Grossman (2000), health is a durable commodity, and by nature, individuals already inherent stock of health that in course of time, depreciates, nevertheless could be appreciated through investment. In view of this assertion, child early entry into the labour market may increase health stock depreciation in the short-medium-long term period of time. In other words, child participation in the labour market has the possibility of reducing health capital and subsequently lower productivity and lower wages in future. The commodity of good health enters directly in the individual's utility function and sick days are considered as being a source of disutility.

In a seminal work of Jacobson (2000), an extension of Grossman, the family is seen as a producer of health. The assumption that underlies this model is that the family chooses an amount of market goods in order to maximise

family lifetime utility, given the health production function which depends on several factors as child, community, household characteristics, purchase of health services and food intake. Considering this framework and evidence that health is consumption and investment, husband and wife with a child result in family utility function. Psacharopoulos and Woodhall (1997) mention that human resources are wealth and they eventually determine the pace of economic and social development. That is to say that human beings are the active agents in the human capital accumulation.

On-the- Job Training

The literature on human capital makes it clear that, not only schooling is a lifetime beneficial to the individual. According to Osterman (1980) formal schooling is not only the asset or ideal way to measure stock of knowledge and confer on individuals the necessary skills, and that apprenticeship training is also a form of human capital investment. The form of this human capital accumulation is the informal procedure and takes the form of learning-by-doing, but it is considered as tacit knowledge which promotes continuous learning and hardly leads to innovation (Lall, 1987). As such it is controlled by unspecified and randomly assigned oral task. Similar argument by Becker (1993) and Psacharopoulos, 2006).also note that training has to do with conscious and systematic development of human knowledge and upgrade of skills in line with emerging skills of work. Training equips individuals with good knowledge, responsibility, cooperation, or other forms of skills that would be beneficial in the future.

However, there are some benefits of education that overrule those of apprenticeship training. Recent literature of Hanushek and WoBmann (2010)

emphasized three mechanisms through which education is important: education increases the human capital inherent in the labour force, increases productivity, and the transitional growth towards a higher equilibrium level of output. Second; education has the ability to increase the innovative capacity of the economy, new knowledge on new technologies of products and process of innovation. Third; education facilitates the diffusion and transmission of knowledge needed to understand and process new information and its successful implementation. According to Cheechi (2005), households are less aware of the economic benefit of education and thereby, prevent children from attending school, but prefers apprenticeship training. Nevertheless, families demand schooling in the influence of family resources and access education at a cheap cost.

Theory of Minimal Capabilities

Another Nobel laureate, Sen (1985), explained the reasons why people go to school and used the notion of functioning to formulate his theory. The theory of functioning rests on human beings possessing basic skills and capabilities. He noted that being able to read, calculate and process information can be thought as more important for conducting a normal social life (appearing in public speaking or performing activities without shame). To buttress this point, simple ordinary life activities need education to function successfully include, using public transport, finding a street/directional address, filling a form, checking bill, signing a cheque, enrolling a child at school and reading manuals.

Also, Sen (1992) posits and emphasised that exhibiting these simple and basic capabilities is like a non-excludable public good, since they pave way for

more complex organisation in social life. Based on this premise, the provision of compulsory and universal basic education is just as the provision of any other public good. The basic education offers a set of capabilities that evolves with time. The extent of capabilities acquired by individuals is assessed by differentiated tests, and the most prominent measures are writing, basic level of literacy and numeracy.

The Structuralist Tradition

The human capital theory under the structuralist approach offers a competing view for investment in education. The structuralist views education as a signal or as a screening device (Lester, 1975). Lester explained that education filters or screens the intelligence of the individual without enhancing them. Individual innate ability signals to the employer and allows the employer to screen out more able employees. A complementary understanding to signal is that education considers the role of information revealing, linked with schooling experience.

Based on the theory, the ability endowed is regarded as student's private information that yield a private return to the individual. The individual innate ability constitutes the productive factor for employers which enters positively in the output production function, however, it is directly observable. In this view, it is not clear that education increases the productive capacity of the individual or society, but it may not have social return.

Further explanation holds the fact that one unit of talent maximised would earn higher wages. In this regard, the educational achievement of the individual signals and reveals their true endowment of talent to employers (Arrow, 1973; Spence, 1973; Stiglitz, 1975). In other words, Spence explained

that education provides signals to employers, the abilities of an individual seeking employment which does not necessary increase productivity. Criticisms surrounding human capital approach point to the fact that if education is a signal or screening device, then there are more efficient and less costly ways of accomplishing than requiring individuals to attain more years of schooling.

The focus of the research highlights the basic acquisition of skills necessary in gaining knowledge. In other words, creation of minimal capabilities. In summing up, the human capital theory gives a vivid explanation that a healthy population is a productive population and hence, a strong link between education, health and economic development. Without education and health, other forms of resources would not be meaningful to humankind. In addition, the literature on human capital accumulation shows that in the life time of the individual, the early investment is cognitive skills development that is expected to yield both private and social returns.

Many scholars in the academia have endorsed the human capital theory. Notwithstanding, one major critique of the theory is that, the human capital theory failed to explain how education enhances productivity and as such differences in wages exist. It imposes a single explanation to education and the future returns to education.

The theory further treats education as a homogenous input and that by assumption higher levels of attainment is likely to produce higher productivity and wages. This is not always so because the process of human capital accumulation varies, in that individuals learn differently and quality of education also differ. Investment required to achieve the future desired outcome

in urban schools may necessarily be different from those in the sub-urban schools due to the fact that individual possesses unique characteristics.

Overall, the literature view education as consumption, whilst others argue that it is investment or functioning. In this perspective, facilitating educational access to more disadvantaged individuals can promote economic development. Indeed, human capital theory encompasses a wide spectrum of qualitative changes. Whether schooling is a commodity, investment, training, screening or a job ladder, it is a productive asset in utility and wealth maximisation.

Theory of Child Labour

Satz (2003) notes that a child is viewed and defined according to the chronological age. Even-though, age consideration varies among countries, below 18 years is considered a child, and the concept of it embodies development stages. Because a child is a developing being in areas of cognitive, affective and moral capacities, there are altruistic (both father and mother) obligations such as protection, nurturing, education and health provisions needed for the child. That is to say that parents are the primary decision makers and have power other than the child about how time allocation is made over the child's life.

The allocation of time by parents may be in terms of schooling, leisure and labour market opportunities. Thus, schooling and labour opportunities are trade-offs to each other. It is noteworthy that making a choice of labour market for the child may take custody of schooling, and the cost of it may extend into the future of having long term consequences on education, health and better job opportunities. However, child labour may also be voluntary from the child side, but it is not morally justified, as child labour is examined in different contexts

of alternative models (Humphries, 2012). One theory that underlies child labour is the luxury and substitution axioms (Basu & Van, 1998). The luxury axiom emphasises that a household would only send a child to work on the basis of household insolvency when income falls below a subsistence level that family becomes financially insecure. Thus, the survival of the household depends on child labour contribution, regardless of the kind of activity the child is exposed to. In line with that, schooling and leisure are viewed as luxury goods.

Basu and Van (1998) further posit that adults and children are considered as substitutes, subject to adult equivalency correction. In other words, children can do what adults do. This substitution axiom emphasizes the literature on "nimble fingers" which describes the view that children are better than adults in some tasks. The substitution axiom further assumes that the economy may consist of adults and children in households. Productivity depends on labour intensive, and each adult can supply one unit of labour likewise the child. Children work full time and receive a wage just as adults. However, children work only if adult income falls below the subsistence consumption level. The substitution axiom has a great deal of validity, in the sense that Basu and Ray (2002) is right in asserting such axiom that in India, children are comparably good as adults at producing hand-knotted carpets. The industry basically employs children to perform specialised duty due to productivity advantage over adults related to their little fingers. As a necessary consequence, though adult wage may cost more, it is possible to replace adults labour with child labour.

The discussion above throws more light in line with Zelizer (1985), who commended that child labour is necessary for character training, discipline and

industrial competition. Social norms, particularly on the social cost or stigma cost of sending a child to work could be seen in the lenses of (Lindbeck, Nyberg & Weibull, 1999). The author was of the view that household decides to send child to work only if the difference between the wage rate of the child and the number of children expected to be working gives more benefit.

Moving ahead of poverty and social cost of child labour is the poor educational system or quality, availability of schools and the transaction cost involved. It is worth reflecting that incidence of child labour gives response to government incentives to make schooling more attractive by provision of social programmes such as school feeding programs, stipends for school going age children or cash transfer programmes to households. Yet, some families still cannot afford to send their children to school full-time. The cost of child labour, both present and future provides interesting insights into schooling, health and morals in particular. Any violation to these basic needs contributes extreme harm to children (Satz, 2003).

Drawing inspiration from the dynastic trap theory of child labour, the well-established literature of Emerson et al. (2014) gives a solid theoretical background of household decisions addressing the critical key issues in schooling, leisure and child labour activities. These three categories of child activities are not mutually exclusive in human capital accumulation. Prominent attention is given to when a household allocates child time to labour market and schooling and a rise in work activities, have the implication of a fall in schooling. Dynastic trap makes an assumption that a child who receives more years of education accumulates higher human capital and future earnings capacity.

Intuitively, a child engaged in the labour market activities, receives less education, the possibility of lowering future wages, and the probability of their offspring being sent to the same labour market and poverty continues, resulting in generational trap. A generational tree grows in the household as a child labourer tend to become an adult and bring forth children who are also child labourers (Basu, 1999). But individuals could escape this trap, if conscious effort is made to focus on schooling, thereby likely to have better job prospect and consequently larger income in future.

The trap raises some government policy intervention on education in order to entice children to be in school. This may include, subsidized schooling, information campaigns to create parental awareness on the adverse effect on education or access to credit facilities. The theoretical literature conclude and reinforce that poverty and positive stigma play a significant role of the incidence of child labour. Further, less schooling during childhood generate into adult poverty in the long run, since hours spent in the labour market detract from the child total schooling years and consequently diminishes future earnings.

It is important to note that poverty axiom, a monetary determinant cannot go critiqued. Households which have large landholders or acres of agriculture land signalling a great assert also engage children in labour. Since land is an asset and for that matter greater wealth, we conclude that engaging children to work does not necessarily mean there is poverty. A household may not be in favour of child work, but owning one more land or having larger number of cattle, may choose to engage the children in work activities simply because the household perceives that child labour is more rewarding than any

other. This simple wealth paradox does not conclude automatically that poverty is the causal factor to child labour (Lima, Mesquita & Wanamaker, 2015).

In addition, the level of wealth cannot always assume a cause of child labour, though a growing number of authors have focused their attention on this argument and it has been found in many research studies to explain the prevalence of child labour. In contrast, what determines child labour is multidimensional assumptions that could also come from social context, strong bond for traditional virtues, weak legal frameworks that ban child labour, parental characteristics that mostly move along with parental attitudinal preference and motivation towards child schooling. Parental risk preferences in terms of insurance against future economic shocks and time preferences, all induce higher probability of children to enter labour market. This illustrates the fact that no specific factor may contribute to the household decision to end child labour phenomenon.

There is another controversial issue surrounding the concept of child labour. There is no uniformly precise definition in the literature as to what constitutes child labour in the stand point of activities they perform and the extent of harm it is suspected to render. So far in the literature, child labour has been that children who engage in economic activity that is likely to infringe on their economic and social development. This according to them, the economic activity brings wages in the form of supplement to the household. Another strand of categorisation of child labour is the consideration of the nature of work and hours spent at work that is likely to endanger the child welfare. In this vein, however, there may be significant number of children who engage in non-economic activities, thus, working for hours of time that are equally likely to be

hazardous to their human capital formation. Arguing from the human capital formation perspective, these children may be more disadvantaged than children in economic activities. Furthermore, the issue of non-economic activities engaged in by children may have important gender dynamics.

In brief, schooling is the only channel that human capital could be developed, and that starting work at younger age endanger the forgone earning during adulthood period. Working at a tender age before the legal employment age, endanger the child's health, because the child is not developed conditionally to perform tasks like adults. Children who work may lack literacy, numeracy, broad knowledge to take informed decisions in society and their fertility rate is also likely to be high. As a result of this, child labour may still exist. Reading simple statements can help adults, especially empower women to demand their right and lower fertility rate, and consequently not live in an ignorant society.

Theoretical Framework of Household Allocation of Child

Endowment Time

The theory of economics of child labour follows the conventional theoretical framework of household decision, and much of the literature emphasize common preference of two agents, preferably adults in the decision process. The model takes its roots from influential works of Samuelson (1956) and Becker (1964). Subsequently, Basu and Van (1998) have made tremendous theoretical reviews that characterize the household as a single unit, for that matter one agent in the household takes decisions to maximise the welfare of the child. However, the study sought to review the traditional household power structure and its propensity of incidence of child labour by relaxing the power

of one agent assumption and introduce the other agent (Browning, 1992; Basu, 2006, Doss, 2013).

The study therefore, makes further assumptions on child labour supply and the extent to which it affects the child's prospects in human capital formation. The basic assumptions that underpins the study are as follows:

Individuals have three stages of life: childhood, adulthood and old age periods of life. Childhood is the period when a child acquires formal education through the decisions made by the parents. Adulthood is the period of work and the old age is the last period where retirement takes place and also investment from child schooling is reaped. There is overlapping generational model (OGM), where parents take care of the child and child becomes adult and expected to take care of the parents at old age.

The households are homogeneous and have three agents; each includes father (*f*), mother (*m*) and at least a child (*N*). The social set-up of the household is assumed to be monogamous family. Husband and wife exhibit altruism about their child. The parents care for the child, for that matter the child stock of human capital formation outcome is pure wealth maximization and it may be influenced by how parents perceive education. The parents therefore, see the child as an investment good. However, the child becomes a consumption good in the future. The parents have the preference to allocate child endowed time between schooling and work, holding leisure constant for simplicity.

Nevertheless, each parent therefore, has distinct utility preferences and maximises a weighted average of each utility function that captures the balance of power (θ) regarding child human capital formation. Thus, parents pull income and reallocate resources according to a sharing rule and each member

maximises utility subject to budget constraints. The assumption is also held that both parents find it painful of their child labour and undesirable as well as the cost of child labour is considered. We therefore, study the relation between household attitudinal preference and the possibility of prevalence of child labour.

There are two time periods *t* defined as t_1 and t_2 lived by the household. In the first period (t_1), the child is expected to attend school (investment period); which at each point in time determines the probability of child's educational outcomes, whilst the second period (t_2) is the future job prospect and expected gains to the parents (consumption period). Hence, following Basu (2006) the father and mother maximise their utility with two periods of t_1 and t_2 (C_t) and child schooling of the ith child (S_i), is represented by a sum of linear combination given by:

$$maxU_j c_1 c_2 = \sum_{t=1}^{2} \theta\, U_{mt}\{(c_m, S_i\,, z\} + (1\text{-}\theta) U_{ft}\{(c_f, S_i\,, z\}, j, m \quad .(1)$$

Where C_j is the consumption goods of parents. It is also assumed that the utility function is convex, such that $U_j > 0$. The weighted average (θ) is assumed to increase as the mother's preference for child labour also increases. The weight of each agent of the household influences the decision process regarding the welfare of the child. Thus, the bargaining power in this framework is the ability for one agent (particularly, mother) to exert influence on the other and may depend on variables such as income, employment, assets and educational background. It lies between zero and one; that is $\theta \in [0,1]$. Again, θ is assumed to be exogenous (Basu, 2006). S_i is the schooling variable in terms of school attendance, educational attainment and cognitive skill development (educational performance) of the child and it is an increasing function and

continuous variable. The Z is a vector of explanatory variables of household characteristics, child characteristics and school characteristics that control the utility function.

The desired returns to schooling outcome of the child is influenced by the extent of premium placed by parents on education, therefore, higher parental preference for child formal education imply greater marginal utility. Notwithstanding, each parent attitude towards child formal education in the first period, is faced with uncertainty or risk in terms of more years of schooling and job prospect that would bring back money to the household. Based on this premise, if one parent is presumed to be more positive towards child labour, may decide to place less value on education by sending child to the labour market, basically measured in child labour participation and child labour hours ($W_N h$). This suggests that child labour through apprenticeship gains is weighted over gains through schooling. The child is endowed with one unit of time, one parent may allocates child's endowment time (T) between schooling (S) and child labour (W), since the household seems desperate with child's contribution on future returns. This decision is likely to shrink the total time allocated for the child's investment in education. Hence, a simple algebraic expression for capturing trade-off between educational outcomes and labour market opportunities is:

$T = (S_i + W_N h) = 1, \quad T' > 0; \; T'' > 0$ ..... (2)

Recall that both parents are altruistic and feel pain to send child to the labour market, but their preferences differ. The assumption is held that as θ increases for the mother ($\theta < 1/2$), amount of child labour hours begins to fall but then, as $\theta > 1/2$, child labour hours rise again, resulting in concavity and convexity,

respectively. With all-positive attitude (θ=1) may lead to child working more hours since the agent would now view child labour worthwhile because additional income from the child contribution goes to the powerful agent. In other words, the household would prefer more child labour hours in order to maximise U_j. The theory generates U-shaped relationship between positive stigma and the amount of child labour hours (Basu, 2006).

In such a case, all powerful woman and all-powerful husband implies the same effect of child welfare. In the case where the all-powerful mother is often perceived to be more sensitive to the pain of the child labour relative to the father, it is worth emphasizing that the U-shaped assumption would be violated, then the amount of child labour hours falls, resulting in a tau-shaped U (inverted U-shaped). This also means that, the mother and the father are likely to differ in decision towards the child's schooling and labour market issues. Thus, the opportunity cost of schooling [c($W_N h$)], also known as the cost of child labour to the household becomes:

$[c'(W_N h)] > 0 \quad [c''(W_N h)] > 0$ for all $W_N h$

Therefore, the utility optimisation is:

$max U_j c_1 c_2 = \sum_{t=1}^{2} \theta\, U_{mt}\{(c_m,\ S_i,\ z,)\ \text{-c}(W_N h)\ \}+\ (1\text{-}\theta) U_{ft}\{(c_f,\ S_i\ ,z)\ \text{-}\ c(W_N h)\ \}\quad j = m, f$ ……..… 3

In Ghana, even though education is under capitation grant, parents incur some cost such as transportation, uniform, school bag, textbooks, notes books and other educational expenses, then S would also be influenced by cost of education PsS as well. In other words, though education to some extent is free, the cost of aforementioned variables could be significant. In the first period, household income comes from parents' non-income (V_j). Suppose both parents

and child are in the labour market, they generate income (Y_j) and (WY_N) from child labour to meet the cost of household consumption of composite goods (P_{cj}) in the first period. Therefore, the parents' income constraint which depends on household characteristics and labour market opportunities for the child in the first period would be:

$C_j = f(V_j, Z, Y_j) = P_{cj} + PsS + WY_N$ ……4

Therefore, the household utility function is modelled as:

$maxU_j c_1 c_2 = \sum_{t=1}^{2} \theta U_{mt}\{(c_m, S_i, z,) - c(W_N h)\} + (1-\theta)U_{ft}\{(c_f, S_i, z) - c(W_N h)\}, \quad j = m, f$ ……..5

Subject to: $C_j = f(V_j, Z, Y_j) = P_{cj} + PsS + WY_N$

and time allocation constraint of the child as: $T = (S_i + W_N h)$ ……6

Parents' consumption in the second period (period of great returns to parents) depends on the child's schooling outcomes and future job prospect in the labour market. For the purpose of the study, future job prospect is held constant. It is expected that the three characteristics are likely to predict the desired child's schooling outcomes. Such that:

$S_i' = f(Z, W_N h, \theta_j), i = 1, 2 \ldots K$ ……7

Furthermore, the optimal time constraint is:

$W_N h = f(Z, \theta_j)$……..…..8

In conclusion, the theory on intra- household decision making basically rest on two adults in negotiation based on the preference levels to child welfare outcomes (Doss, 2013). The negotiation process depends on the endowment levels of each agent in the household. Due to the nature of the negotiation process, the woman is the focus where we consider bargaining power as her ability to influence household decisions and outcomes. The conventional

framework is that education, income, labour market participation and assets empower one agent in the negotiation process.

The household power structure of bargaining model reviewed above has pointed one critical gap most intriguing. The theory is not distinct and basically rest on conditional proposition, diverse assumptions and predictions for which its direction to child labour-education trade-off becomes unclear. Whether child labour increases or not, depends on assumptions. There are a few but very relevant lessons drawn from Basu (2006) in deriving its implication to child labour supply. The theory renders itself into dynamism in explaining household decisions in the sense that depending on the assumptions posed, may reveal various interesting results. The theory is viewed as a spadework for modelling household decision making. Secondly, income earned by the woman has been the measure that is clearly related to women's empowerment (Doss, 2013). However, it only applies to when the income is controlled solely by the woman herself.

Empirical Literature Review

Theory of Altruism, Household Power Structure and Child Labour

The altruistic behaviour assumption of the household forms the building blocks of models of child labour. The direction of effect of child labour on the human capital accumulation depends on the specific underlying assumptions. In this section, the study reviews the available empirical literature related to altruism, power structure of households through bargaining models that are likely to affect child labour.

Frempong and Stadelmann (2020) analysed parental risk preference on child labour and schooling decisions in households of Ghana and Uganda. Education

was the proxy for women empowerment. Holding on to the assumption that school and child labour is a function of the risk preference of the head of household, the authors found that risk averse households are more likely to send their children to the labour market as insurance for future economic shocks and for immediate employment. Child birth date served as the instrumental variable and further confirmed a causal relationship between risk aversion and child labour. In other words, risk aversion induces higher probabilities of child labour. Hence, based on the risk behaviour of the household head, mothers' power on child labour becomes ineffective as well as that of school enrolment. However, years of schooling of both parents have positive and significant effect on child schooling for both countries. Thus, higher schooling levels of the parents is associated with higher probability of child schooling, and lower probability that children from Ghana and Uganda have to engage in child labour. More importantly, the findings confirm that education-induced bargaining effect has no relevance to household welfare. We conclude that whilst female education has the potential to enhance household welfare, the effect does not necessarily work through bargaining power.

Similar evidence on household risk preference on child labour-education trade off exist in the work of Basu and Dimova (2020). Relying on Ethiopian household data, the authors found a positive correlation between adult risk aversion and child labour. In depth analysis further showed that child labour abounds in Ethiopia as a result of risk aversion and that parents who are sensitive to risk react quickly to uncertainty environment by substituting schooling for labour market opportunities.

According to Majeed and Kiran (2019), the child allocation time choices between work and education depends on the household power structure. Particularly, the woman is regarded as a key role player using her participation in decisions with economic empowerment. The assumption is held that women in decision making enhance economic development. Therefore, since child labour is noted to be detrimental to the development of the child, women empowerment through negotiation influence positively on child human capital accumulation. Empowered women increase their ability to involve themselves in decisions on household affairs, and that decrease the likelihood of child labour. Such empowerment emanates from women's education and employment status.

In Ghana, Afoakwah, Deng and Onur (2018) explores the effect of women's intrahousehold bargaining power and children's schooling outcomes in Ghana using GLSS-6 data set. The collective household model provided the appropriate theoretical framework that considered age at first marriage and age at first employment as proxies for women empowerment. In line with the theoretical model, the literature supports the view that, increased women bargaining power reduces the chances of slow progression of children's education. Even though, fathers may play a peripheral role in the household, women mostly engage in children upbringing. Therefore, bargaining power of women in the intra-household decisions has the potential to improve children's schooling in terms of attainment.

The study of de Hoop, Premand, Rosati and Vakis (2017) investigates the female economic empowerment and children's human capital accumulation in rural Nicaragua. Adopting the productive capacity as the women source of

empowerment, the authors noted that higher productive capacity of women is likely to affect children's time through increase in school enrolment by 8% point and less likely to be working in the child labour market. It was concluded that women's influence on decision making in the household depend much on the ability to participate in the labour market. Hence, it stands to reason that increased power of women within the household balanced with labour market participation would be a very good predictor of children outcomes, especially in reducing child labour. Similarly, Martinez (2013) validated the bargaining model in line with household preferences and found that household power distribution has real effect on child outcomes like school attendance of children. The result also suggests that women are more directly concerned with the well-being of their children than fathers. Mothers who intend to maximise child schooling used their increased power within the household to allocate more resources. This opens up a policy instrument that can be used to promote credit programmes and as such provide access to credit for women who are poor in order to allocate more schooling resources for the child and consequently reduce the incidence of child labour.

Focusing on female wage income as a proxy for bargaining power, Nordman and Sharma (2016) found that female bargaining power has significant and increasing effect on the household share of educational spending on child's education. The wage income is the maternal autonomy that directly influences the child educational outcomes, particularly girls. This result finds support with the theoretical literature of Doss (2013) that asserts that maternal power is directly affected by child outcomes. Nordman et al, further provides evidence that the gender bias in favour of boys differs along caste lines,

especially in the urban areas of upper caste groups. Antman (2014) also supports this hypothesis which point to the fact that increasing economic resources yield greater bargaining power when the female is found to be employed, and then steer the decision-making process in her preferred direction. The author stressed that the head of household is less likely to be the sole decision maker given that the spouse participates in the labour market. Furthermore, using OLS and fixed effect regression, the results confirmed that 'household head alone' making decisions regarding home expenditure has significant and negative effect when spouse works. In addition, both spouses making decisions in the home expenditure is direct and significant. This analysis was explored from Mexican family life survey, which covered demographic, expenditure and labour supply data from the household.

Using panel data from Nigerian households, Ngengebuke (2016) explores the effect of female bargaining power on child education and labour outcomes. Female control on her labour income is a proxy to bargaining power. Modelling child outcomes as an interdependent variable between child labour and schooling, Ngengebuke found a positive significant effect on child education when the female controls her own income and negative for child labour. Furthermore, greater female say is conducive for higher grade attainment. On the other hand, grade attainment increases with child from biological mother as child labour reduces. Noting gender balance, girls seem to work less than boys, whilst child from educated mothers as well as wealthy households tend to work fewer hours per week. Women's labour market participation, and for that matter, bargaining power is therefore, acknowledged as a cross-cutting issue and a double dividend for women and child's welfare.

However, Edoh-Torgah (2018) presents a contrary argument that although parents might exhibit altruism, the discussion is whether or not there is positive conception about child labour. Edoh-Torgah, further explains that, parents perceive that child labour is safe, for that matter schooling could be combined, with the benefits that child would inculcate valuable skills needed to be responsible in society. Relying on the assumption of cultural preferences, the study was tested empirically in Ghana using two instruments for measuring stigma: child indigenous background and household head experience. Edoh-Torgah (2018) illustrated that positive stigma has larger effect on child labour practices but modest effect on school enrolment. The result demonstrated that there is no need for education, which seems to undermine schooling as an investment.

Similar argument raised by Tafere and Pankhurst (2015) asserted that child labour has no negative significant effect on schooling in Ethiopia. The overview of the empirical literature expresses that young children benefit from working as it helps them to acquire skills and attempt to explain in line that trade-off occurs as a result of persistent work. The author further explained that child labour may benefit from work experience, in that moderate amount of work in a supervised environment allows the child to develop skills necessary for being responsible in society. It is emphasized that, work does not necessarily mean child's education is not valued, while they have to work in order to pay educational cost. Minimal hours of child labour have no negative influence on test scores in the short-run. Tafere et al. (2015) used a cross-section data set based on child and household characteristics from young lives international.

It is also important to note Ariyanti (2016) contribution on socio-economic factors affecting child labour in Indonesia. Logistic regression was used with survey data from Palembang city of Indonesia. Children between 7-15 years who combine schooling with work were the target. It was found that both father's and mother's employment status drive child labour in Indonesia. Particular emphasis is placed on the informal sector jobs where children learn the craft of their parents. However, parental education and income appeared not to be important in child labour issues.

Bourdillon (2017) and Morrow and Boyden (2018) draw conclusions that child labour has many economic benefits to the household and society in that, apart from relieving them from household insolvency, it fosters self-esteem in children who are otherwise marginalised, children grow in autonomy, develop essential life and social skills which make them become responsible. The argument follows that though education is important, it forms one aspect of learning but not necessary the most effective for building up skills that children need to function as productive in the adult stages of life.

Child Labour and Educational Outcomes

The extent of child work on cognitive development has been recognised by Keane, Krutikova and Neal (2018). The study involved four low and middle-income countries' namely; Ethiopia, India, Vietnam and Peru. The authors estimated child work in terms of economic activity and domestic work. Field data was obtained from Young Lives multi-country panel data set on two cohort of children: (12-19 years) and (5-12 years) older children. The OLS and IV were the techniques adopted for measuring child work as its affect cognitive ability.

Keane et al. (2018) revealed that both domestic and economic activities are not detrimental to the development of cognitive skills per se, however, if they crowd out school time. The detrimental effect of child work time is greater if it crowds out time spent studying at home. Time spent on economic activities is associated with greater reductions in school time than time spent on domestic chores. Child work is detrimental to the cognitive ability in maths and verbal skills, and that an increase in work relative to school lowers scores in maths between 8-15 years, holding for both old and young cohorts of children. The analysis makes it clear that it is not automatic that child economic work activities affect child cognitive development, but it depends on the extent to which work conflict with human capital accumulation.

Using a country data set from Guatemalan households, Canelas (2015) studied the determinants of hours of work, school related activities and domestic work between children of 7-16 years. The study analysis was based on Tobit regression, and the central evidence revealed that, child labour significantly reduces the likelihood of completing basic school; and four times more likely to drop out from school or never enrol in school. The dropping out of school becomes prominent at the higher basic level of schooling, suggesting that drop-out rate increases with age of children.

On gender basis, child labour increases the likelihood of dropping for both sexes, but domestic work adds more pressure for girls' time allocation which further increases school failure. Household wealth proxy as existence of basic household services revealed that, children from household of 4^{th} and 5^{th} quintiles distributions are 17% and 35% less likely to drop out of school relative to first quintile. Educational attainment of household head reduces the time

allocated to market work for children in child labour, whilst, female adults in the household decreases market activities for children.

Some other studies have found evidence of negative impact of child labour and learning outcomes. Emerson, Ponczek and Souza (2014) observed second-eighth grade children between 10-17 years in Sao Paulo, Brazil. Emerson et al (2014) reported that children working while in school impede students' learning performance on standardized exams in both Mathematics and proficiency in Language (Portuguese) scores. The extent of effect is approximately between 3%-8% of a standard deviation reduction in mathematics and language scores. The intriguing effect is that children working continuously within months and years leads to a further drop in test scores. The authors further found evidence that the impact of child labour and schooling occurs through the interference of working during school time. The conclusion part is that there is evidence that work impair learning, however, skills and capabilities are acquired through child labour.

On the other hand, Holgado, Maya-Jariego, Ramos, Palacio, Oviedo-Trespalacios, Romero-Mendoza and Amar (2014) examined child labour and schooling in Colombia. Analytic Hierarchy Process was used to measure academic performance and found out that type of work, hours of work per week (intensity of work), working in the morning (moment dedicated for work), negatively affect academic work over short, medium- and long-term periods. The authors noted that, although the results show a negative effect, the relationship between work and school is a conflict and as such not a simple relationship that could be explained in simple terms.

Particularly, the conditions in which child labour is carried out, whether hazardous or worst forms of child labour, deteriorated working conditions, work subjected to physical or psychological risk clearly negate academic performance. Therefore, it suggests that the negative effect of child labour in educational context depends on working conditions and type of activity engaged by children. Furthermore, participation of child labour in the morning competes with school contact hours is more probable to impede academic performance. It is worth highlighting that performing child labour activities before or during school hours automatically has a differential impact on the children educational experience. Working at night and after school hours were insignificant.

The empirical literature of Cuesta (2018) focused on the link between child labour and academic achievement in Ethiopia. Four broad indicator variables were used: child, household, school and community variables using data from Young Lives households. Cuesta found evidence that whether exogenously or endogenously determined, child labour participation and its intensity have significant negative effect on test scores in vocabulary skills and mathematics as well as affecting all ages, especially children between 12-15 years. Children performing different kinds of work are also consistent with the estimates of the adverse effect on future returns in schooling when adults. In conclusion, child labour increases the cost of human capital accumulation.

He (2016) emphasized the "link between child labour and school achievement in Gansu, China". A longitudinal, multi-level survey from Gansu children and families' data, with quasi-maximum likelihood estimation found that children working for more than an hour impede the academic achievement after

controlling child talents. Working hours negatively affect child schooling, even the first hour and then further weakens as hours increase. Both parental backgrounds in education influence child schooling and specifically mother's education has more power than father in favour of child's schooling.

In the educational production, resources are needed for skill development. Due to this fact, Borga (2019) focused on children's own time use and its effect on skill formation. Skill formation is the cognitive skills which measured the child's score on Vocabulary and mathematics. The norm-referenced test offered both raw and standard scores. Child time use was categorised as hours of work, hours of study and hours of leisure. Hours of work included household chores, paid work, family business and caring for others, whilst hours of study encompassed with time spent at school and studying at home and lastly leisure time: sleeping and playing. The empirical literature covered Ethiopia, Vietnam and India and explored the extent at which the three categories of child time input impact on the acquisition of cognitive.

In consistent with other studies, Borga (2019), confirmed a significant and negative effect on cognitive achievement given the hours of work. Meanwhile time spent at school is productive to cognitive skills formation. Further result confirms that spending at least one additional hour per week in school relative to paid activities still remains positive to cognitive skills as one year of parental education. It further implies that child labour regarding paid activities has an adverse effect on skill formation through reduction in hours of study. Similarly, one year more of parental education an hour spent on work has an equal effect on cognitive skills. It also cut across all the countries studied. The estimation results also showed that children in the younger age cohort are

much affect to the cognitive skills than the older age cohort supporting the view that investment in early stages of childhood is larger than in the adolescent stages. With age having an increasing effect on cognitive skills development, the control variables, higher wealth index is positive to cognitive skills, whilst higher household size reduces scores in vocabulary and mathematics, respectively.

The empirical evidence of ThuLe and Hosmel (2015) studied 'child labour and children educational performance'. ThuLe et al (2015) hinged his augment on the poverty hypothesis of Basu et al. (1998) for that matter household wealth is the most important factor in the analysis of child labour-education trade off. Therefore, emphasizing that child labour only arises when adult income is below the subsistence level for household sustenance. Drawing on household survey data, tobit and ordered probit model showed that child labour has a negative impact on academic performance and the effect is prominent among girls. Putnick and Bornstein (2015), also explored whether child labour is a barrier to school enrolment in low-and-middle income countries. The study employed 7-14 years old children who work outside the home, 'family work and household chores' and school concurrently. Significant negative relations emerged between each form of child labour and school enrolment. Child labour is also negatively related to school attendance and learning (maths and reading test performance). Working children are less likely to attend school regularly.

Kumar (2015) discussed the grade transition and child labour in rural Bangladesh of children between 7-14 years. Based on the family background and child-specific characteristics, the results from bivariate probit regression

found that children from educated parents are more likely to transit and significantly decrease participation in labour force. Kumar (2015), utilised data from the MICS-3 and predicted that children who are irregular school attendance are more likely to participate in labour force with schooling. Moreover, resource constraints in terms of wealth and time significantly increase schooling and reduce child labour.

Again, Kumar and Saqib (2017) identified some factors hindering the achievement of the universal primary education for rural Bangladeshi children. A bivariate probit model was used with data from MICS, of children between 7-14 years, focusing on parental education and household resources, child specific and household characteristics on the grade-transition of children in labour force. Kumar and Saqib (2017) found that parental education, birth order and child working are grade specific. Fathers' education has greater effect on grade transition of lower grades, and mothers' education had greater effect on the grade transition in higher grades. First born children and children whose schools have been interrupted due to child labour in lower grades are less likely to transit to the next grade and more likely to participate in the labour force. Children from poor economic status households are more likely to participate in the labour force, as such they combine schooling with work and are less likely to specialise in their academic work. Children of more educated parents are less likely be work for more hours or combine study with work.

The detrimental effect of child labour on educational attainment and achievement was investigated by Woldehanna and Gebremedhin (2015). Recognising the interdependency of child labour and education, results from Ethiopia revealed that, cognitive achievement as measured by Peabody Picture

Vocabulary Test (PPVT), child work has a negative effect on children's raw scores. Therefore, there is causal evidence that child work has adverse effect on attainment. Orrnert (2018) disentangles the effects of schooling and child labour. According to the author's view, child labour has negative impact on the educational trajectories.

Mukherjee and Pal (2016) discussed the role of parental expectation in influencing child labour and schooling. Using a longitudinal data for children in Andhra Pradesh, India, Mukherjee and Pal (2016) focused on how parental decision about child future returns to education affect child labour participation and schooling. The element of uncertainty was proxy as the premium that parents place on higher returns after education. Recognising endogeneity, logistic regression estimates were analysed in two steps. First, the probability of parental expectation that the child would do a skilled job and secondly, the parental expectations on schooling and child labour.

The authors further considered three parental decision variables, namely: schooling, paid work and unpaid work. Schooling measured share of actual time spent studying. Child wage has a reducing effect of the probability of schooling and increases the probability of child labour for both sexes, particularly boys. Actual time spent studying increases with parents' expectation of getting skilled job, irrespective of gender. Child in unpaid work reduces as parental expectation in skilled work rises. Parents' attitude towards education influence parental expectation about child future job. In addition to the core findings, father's education, mother's education and child inherent ability were significant determinant of schooling decision. The father's education increases child schooling and reduces paid work.

The research of Sasmal and Guillen (2015) examined the impact of poverty, educational failure and the child labour trap in the context of India. They considered poverty as the major cause of child labour that deprives children from acquiring basic skills. A state level panel data using linear regression, found that poor children engage in child labour, as such they grow as unskilled children and has the possibility of earning lower wages. Evidence further shows that child labour trap is more likely to be formed. The authors found that poverty adversely affect schooling. Thus, the study showed that poverty, illiteracy and child labour are significantly related.

The analysis of the various studies has brought to light the existence of trade-off between human capital and child labour. However, some major shortfalls have been identified. A point of criticism of this study is the fact that the existing literature favours the supply side of child labour more than the demand side factors for education. Also, the interdependency nature of child labour and schooling were mostly not considered. Therefore, treating such variables as exogenous renders the model bias, inefficient and inconsistent coefficient estimation. This notwithstanding, it does not also imply that the estimations have to be rejected. It is also important to note that most studies proxy school attendance as being enrolled thus, ignoring the issue of absenteeism element.

Furthermore, the child labour variable was measured as dummy, however, child labour is a heterogeneity variable that encompasses a variety of activities and thus, its intensity appears limited in the literature. Moreover, the moderating effect of child labour hours and nature of work appear missing in literature, thus recognising the interactive nature of the two variables is likely to result in another effect on schooling investment. In addition, there is also a

gap in literature as to how a certain index of hours becomes long hours of work that may affect human capital formation. Also, fieldwork has not been able to identify the particular work done by the child labourer and the hours spent that impede schooling and health. All these are gaps that render the empirical literature for questioning.

Child Labour and Child Health Outcomes

The effect of child labour and health is relatively developing and few researchers have addressed this economic phenomenon. Nicolella and Kassouf (2018) examined whether child labour can have long-term consequences on children's health status in Brazil. Using a structured pseudo panel data from the national household survey (1998, 2003, 2008), Nicolella et al., estimated a fractional response model. Pseudo panel technique was adopted as an alternative to control endogeneity caused by individual heterogeneity and simultaneity between labour and health. Self-declared individual health status measures the morbidity and mortality rates of child labour. The variable of interest is the activity sector; agriculture, services, commerce, construction and industry; and the control variables likely to depreciate child health status were; age, gender, race, household per capita, child wage (investment capacity), education, number of siblings, health status of the parents, clean water supply and type of residence.

The empirical findings show that child labour negatively impact child's health status; and the increasing hours of work becomes profound on the child's health outcome. The authors also observed that hazardous labour has three times higher negative effect on the child's health status. In additions to the findings, children working in service sectors were more prone to having worse health

status. The result also indicated that parental factors, household conditions such as access to good drinking water as well as household income improves health of the child. Concluding, the authors explained that different occupations that children engage in may have different effects on children's health status. The empirical exercise failed to recognise the specific illness/injury children in labour market encounter. Due to the general nature of health effect estimated, it is not clear as to the kind of work-related hazard or risk children encounter.

The empirical evidence of Ibrahim, Abdalla, Jafer, Abdelgadir and de Vries (2018) comprehensively analysed the impact on child labour on physical and mental health in low-and-middle income countries consisting of Bangledesh, Jordan, Lebanon, Indonesia, Pakistan and Egypt. The study used national data and brought to light the epidemiological evidence of adverse effect of work-related illness and injuries. Ibrahim et al found a significant positive effect between child labour and the probability to report injury, tiredness/exhaustion and other health problems. Number of hours and the probability of reporting injury or illness were positively correlated. The cohort age of young children was found to be more prone to suffer backaches, burns, infections and lung diseases, whilst tiredness was greater in the adolescent stages. Working children are also subjected to abuse and behavioural disorders. Children engaged in child labour have poor health status in physical and psychological conditions, cutting across all the countries studied. Children were found to be disposed to and more at risk to physiological, immunological, psychological, audiological and musculosketal effects.

With respect to short-term health consequences of child labour, Sundjo, Baye, Egbe and Mbu (2016) reported an absence of trade-off relationship between child labour and health status. Although, working children were more likely to report better self-assessed health status as a whole, the authors found that, children in the agricultural sector were more likely to report poorer health status. Using individual records of household consumption survey in Cameroon, bivariate probit, ordered probit model and two-stage residual inclusion techniques were employed to model the extent of how child labour displaces good health. Good health was proxy as child not having diarrhoea and respiratory infection which were obtained by self-reported assessment. Using the models appropriately, child labour was instrumented by school quality, child employment rates per region and school availability.

In Bangladesh, Ahmed and Ray (2014) presented a model that links child labour activities to health outcome of children between 5-17 years. The data set contains a detailed information on a range of children: age, sex, marital status, educational attainment, employment status, hours worked, wages earned, self-reported illness/injury; and household characteristics: household size, household composition, land holding, location and asset ownership. Health being considered as endogenous, Ahmed et al., provided evidence that child labour participation significantly increases injury or illness in children, particularly, tiredness/ exhaustion, body injury and other health problems. The empirical literature remains robust as hours worked and the probability of reporting illness is positive. Specifically, injury increases tremendously after a threshold of 19 hours per week. Tiredness/exhaustion increases gradually with number of hours of a threshold of 20 hours per week. The particular task

performed are indifferent to child health status, but it is worth noting that jobs that children engage in increase the risk of injury and are found to be detrimental to their health status.

On gender basis, girls are less likely to encounter illness/injury, suggesting that the nature of work load and risk factor is less on girls relative to boys. Clearly, agriculture for which fishing is a subset appears to endanger child health as the coefficients for poor health conditions are greater in magnitude. Parental educational attainment relates indirectly to all health outcomes. The indirect relationship explains the fact that the highly educated mothers may be more aware of the consequences of the health impact on child as a result of child labour, and adopt preventive measures to treat injury/illness. Social amenities such as safe drinking water, and the number of rooms in the household significantly reduce the probability of injury/illness.

As evidenced in Guarcello, Lyon and Valdivia (2016), hazardous work has the potential of posing threats to health in safety of children. Upon controlling non- hazardous work, hazardous work has greater potential of work-related illness. Guarcello et al. (2016) also found out that hazardous child labour has a reducing effect on school attainment in terms of completion of school, affecting their prospect for upwards mobility and for securing decent work in future. The study covered East Asia and pacific, Latin America and the Carribbean and Sub-Saharan Africa. On the side of gender, male workers have effect more intense relative to females in seven of the eleven countries. The results appear that male children perhaps work in areas with higher intensity of risk related work.

On the other hand, Nishijima, de Souza and Sarti (2015), examined the long - term effect of child labour on health from 1998, 2003 and 2008 in Brazil. The models were based on two stage linear and generalised methods of moments. The results suggest that regardless of the type of work, child labour adversely affect health outcome, jeopardising the formation of human capital. Specifically, adverse health effect identified were physical difficulty, fatigue and prevalence of chronic diseases. Chronic disease such as backache, depression, tuberculosis, heart diseases, arthritis were noted to have significant effect. In light of this, Nishijima, et al. (2015) point to the fact that there is also the possibility that child health would be at the expense of lower educational attainment.

Similar result from Agbo (2017) reinforce the previous literatures of a long run negative effect on child health outcome. Study conducted in Nigeria, show that children between 5-17 years encounter all kinds of health defect ranging from injuries, accidents, chemical poisoning, pneumonia, craw-craw difficulty in breathing and illness encountered by child labour has long-run negative effect on the child's health in the adulthood. The study however, did not provide much knowledge on the severity of the illness/injuries at work. In addition to that, impact of hours of time spent on household chores is another area that undoubtedly could also pose health risk and therefore, merit consideration. That would take care of the total work burden of children health and work.

In addition, Thevenon and Edmonds (2019), provide evidence from Asia and Africa, examined cause, consequences and policies to tackle child labour. Data from ILO described the environmental conditions of child labour

in agriculture. The findings revealed that about one in ten children aged 5 -17 years were engaged in unpaid work. Nearly half of the children are in hazardous work and are harshly exploited, toiling in poor to appalling conditions and performing dangerous activities. Indeed, children are now developing physical bodies and minds, and exposure to work hazards and risk, has the possibility of having devastating and long-lasting health implications. Thevenon and Edmonds (2019) emphasized that physical injury may have everlasting health consequences in the adulthood. Also, stress and excessive fatigue may also generate into mental disorders such as depression, anxiety, panic disorders, diabetes, heart diseases and immune disorders. In addition, long hours of work and heavy responsibilities are compelling evidence that have far-reaching negative effect on their physical, emotional and moral development.

Again, Agbesi (2016) explored a case study at Elmina on child labour in fishing in Central Region of Ghana. The study covered 40 children between 5-17 years engaged in fish catch, transportation and marketing/distribution and upstream jobs. Systematic and purposive sampling techniques were employed to generate the primary data for analysis. Agbesi (2016) noted that fishing is a hazardous work since it exposes the children to noise levels, temperatures, moving water, heavy loads and other risky conditions. The major health problems identified were backaches, headache, chest pain, skin diseases, eye problems, respiratory problems, fever or malaria and body pains. All have the potential of causing severe negative consequences on economic life.

Furthermore, Shendell, Noomnual, Chisti, Allacci and Madrigano (2016), investigated resulting in safety and health concerns for child labourers in less developed countries. Shendell et al. (2016) noted that children are

exposed to extreme cold or heat, poor ergonomics and psychological stress. As a result, children experience various physical injuries and illness, ranging from mild symptoms to severe disability or even morbidity. The adverse health effect also manifest in psychological trauma and psychosocial stressors.

Moreover, Uddin, Hamiduzzama and Morad (2014) explored the hazardous child labour and psycho-physical consequences of Sylhet city of Bangladesh. Examination of both primary and secondary data were used for in-depth analysis. It was revealed that children mostly engage in hazardous nature of work and thus, consequently have debilitating effect on the physical health and growth. Activities such as van pulling, rickshaw pushing, welding, construction create unhealthy conditions. Therefore, these conditions obviously result in different health effects both in the short and long-run terms. Uddin et al. (2014) indicated that children suffer from injuries, mutilation, burns and infections, spinal cord and pelvis deformities and work under the scorching sun or incessant rain. Moreover, skin diseases, breathing problems and eye related problems were identified to be caused by unhealthy and unsafe working environment. Working long hours and hazardous environment also raises their frustration, stress and tension that hinder the development of their mental faculties, abilities and talents that compel them to become introvert and withdrawn from their peers.

Using national data, Mohammed, Mahfouz and Ewis (2014) analysed the environmental and occupational health problems of child labour in the Egyptian community. The study brought to light the epidemiological evidence of adverse effect of occupational exposures as it affects health as well as the development of the child. Specifically, controlling for household characteristics

and adult mortality rate, the authors provided evidence that children working in different forms of work significantly and directly affect health outcomes in terms of burns, wounds, hematoma, skin allergy, severe tiredness, insomnia, breathing difficulty, dizziness, headache and general weakness were the health complaints by children in the labour market. Nutrition aspect of the child also affects the health tremendously. Stunting was found very common among children in the labour force.

On a study of child labour in the marine fishing in Ghana, Agbenyiga (2013) finds that many children are engaged and working in the precarious occupation in marine fishing. Although, marine fishing is a platform of transmitting skills, it is seen as hazardous that interfere with their education and harmful to their health. Posso (2018) on the other hand established how child labour is associated with health in Peru. The econometric results suggest that children engaging in hazardous work activities are more likely to have health problems. Hamenoo, Dwomoh and Dako-Gyeke (2018), in a study of children in petty trading on the highways, revealed that children selling on the street face detrimental conditions to their health. Specifically, children expose themselves to street accidents, injuries as well as death. In addition, headaches, cough, and skin diseases were prominent among the children surveyed.

The evidences pertaining to child labour and health effect have provided some gaps in knowledge. The literature appears now to be developing, and the research study mostly dwell on panel data that measures the long-term consequences. Short-term analysis are required to understand the longitudinal health effect of child labour. In addition, one key area that needs to be tackled is methodology gaps concerning how the health of an individual is measured.

Generally, the state of health of an individual is difficult to obtain and as such most studies employ ad-hoc or subjective measurement rather than objective, leading to under-recognised or misdiagnosed and also difficulty in measuring the psychological effect of work on children. Thus, over reliance on subjective health assessment becomes unclear to policy implementers. Thus, objective measurement is also needed for in-depth analysis. This gives an idea that health effect of child labour is difficult to investigate and is known with its measurement shortcomings.

Chapter Summary

This chapter discussed the review of related literature pertaining to child labour and human capital formation. The review focused on the theoretical and empirical literature. The theoretical literature discussed the historical background of child labour, educational production, theories on human capital formation and the household decision model. Empirical literature reviewed various studies regarding determinants of child labour, school attainment and performance. In view of this, the literature concludes that there is a trade-off between child labour and human capital development.

CHAPTER FOUR

RESEARCH METHODS

Introduction

Chapter four focused on the methodological framework of the study. The research methods are in two parts. The first section covers the research philosophies, research design, profile of the study area, population, sampling procedure, data collection instruments and data collection procedures. The second section includes measurement and specification of variables, empirical estimation of the three specific objectives in accordance with the hypotheses of the study.

Research Philosophies and Research Design

There are various philosophical foundations that underpin social inquiry, making them distinctive and diverse. Based on the assumptions underlying the study, it is appropriate to choose specific philosophical stance. The philosophical divide packaged in paradigm that explains and guides the study is positivism (Sarantakos, 2013). This was chosen because, positivism paradigm places much emphasis on ontology of objectivism or realism, epistemology of empiricism and methodology of quantitative approach of gaining new knowledge about the inquiry.

Following Machamer (2002) principle of positivism, the nature of the study give adherence to the notion of objective way of analysis (discourages subjectivity) and empirical epistemology of how knowledge is created through a credible source of data. In other words, it follows a well-constructed method in that, reality and truth exist objectively. The research therefore, stresses the value of accuracy and precision in measurement. The positivistic approach in

line with the study rely on rigorous, disciplined, systematic and reality-bound procedure (Sarantakos, 2013). It is also intended to investigate relationships between variables and also to explore the cause-and-effect ensuring representativeness and generalisation of the economic phenomena likened to the child labour-human capital formation trade off. Furthermore, using relatively large sample sizes in order to interprets phenomena and generalize is highly acceptable (Gay & Airasian, 2000; Sarantakos, 2013). It borrows the approach from the natural sciences and subscribe to the assumption that reality is measurable in numerical terms governed by laws that consider generalisations to be drawn (Sarantakos, 2013).

Additionally, the study is set upon well-structured hypothesis, or assumptions related to the natural sciences in such a way that the logic of causal inference and hypothetical inquisition is predicated to develop universal laws. Hence, the core of philosophical stance in this study is to ensure objectivity, value-free-judgement in quantifying variables that is likely to result in quantitative approach of statistical analysis.

In line with the tenet of the research, the study relied on a cross sectional survey (Yin, 2009). It involved systematic procedures in collecting and presenting data that gave a clear picture of a real situation at a single point in time. This notwithstanding, the study of children and the kind of varied labour market activities they engage themselves, is not easy task to accomplish. Due to this reason, it becomes relatively simple to study a small part of the target population in order to obtain data that is representative. In this context, the study gave a descriptive and analytical overview of the intensity of child labour-human capital formation trade off of children between 5-17 years old. It aims

at getting relevant information in a quantitative manner related to child labour and human capital formation outcomes of basic school children in Central Region. Therefore, quantitative data was analysed through various statistical tools that estimated the incidence of child labour, educational and health outcomes. This enabled the researcher to generalise the findings from the sample that implicates all children involved in child labour in Central Region.

Study Area

The research was conducted in the fishing communities in the Central Region of Ghana. The Region was chosen because; referring from GSS (2014), children (5-17 years) engaged in fishing/forestry/agric activity accounts for 83.2%, highest from Western, Volta and Greater Accra Regions. It also has the highest of 99% children working up to 42 hours. Also, 12.8% children are deeply involved in child labour activities and 4.2% are in hazardous work, which in this case may hamper educational process at micro and macro levels. The fishing communities included: Effutu, Awutu-Senya West, Gomoa West, Gomoa East, Cape Coast, Ekumfi, Komenda-Edina-Eguafo-Abirem and Mfantseman, respectively. These eight areas lie along the coastal belt of the Gulf of Guinea and predominantly engage in commercial activities in fishing business. In the selection criteria of the study towns, the BECE results was used to obtain four towns: Effutu, Awutu-Senya West, Gomoa West and Mfantseman. These towns were selected because according to GSS (2018), they have low ranking results in Mathematics and English Language. This is shown in Table 2 below. Also, the towns have similar geographical, economic characteristics and child labour in fishing activities is predominant in these areas (GSS, 2013; GoG, 2015).

Table 2: BECE Pass Rate of JHS Students between 2010-2016

Metro/Municipal/District	Mathematics	English Language
Cape Coast	88.4	77.5
Mfantseman	54.9	71.2
KEEA	64.2	74.1
Gomoa West	58	51.7
Gomoa East	79.4	71.7
Ekumfi	63.1	75.6
Effutu	60.5	65.1
Awutu-Senya	62.7	69.2

Source: GSS (2018)

Effutu Municipal, traditionally known as Simpa was carved from the Awutu-Effutu-Senya District Assembly, established by the Local Government Act (Act 462) and by L.I 1860 in 2007. It is located between the Gomoa East on its western side, northern and eastern flanks. It is a historic fishing port in the southern side of the Gulf of Guinea. The total land is approximately 94 square kilometres. The Municipal has a population of 68, 597 representing 3.1% of the total population in Central Region (GSS, 2014a). It has 17,121 households with 3.6 as the household size. Sankor, Fetteh, Ponkoakyer, Lancaster, Penkye, Adanse, Kokobem, Wonsom, Osakem, Kwandrumu, and Dayase communities lie along the coast.

The predominant economic activity is marine fishing, for which there is a high patronage from traders in Accra, Agona Swedru and among others. There are also six banks that provide financial support to commercial activities. In terms of education, the Municipal has a number of nurseries/kindergarten, primary schools, junior High Schools and senior high schools, of both public and private. There is also one University and National Sport College where persons receive training in their specialised field and disciplines. The people of Effutu speak Guan and Fante Language (GSS, 2014a).

Awutu-Senya West District is also a marine fishing town which was carved from Awutu-Effutu-Senya District in 2012. Its administrative capital is Awutu Breku. The district is located in the eastern part of Central Region. It shares geographical boundary with Awutu-Senya East Municipal, Ga South Municipal and Effutu Municipal. The population is approximately 124,724 (GSS, 2014b). The major economic activity is marine fishing and farming. The fishing business is prominent in Senya and employs about 10.5% of the working population. Apart from the fishing business, there is tremendous agro-processing activities which provide jobs for the indigenous people. There is one commercial bank, rural banks and micro finance institutions. The education directorate consist of Awutu, Bontrase, Obracire, Senya Beraku and Jei-Krodua. A number of nurseries/kindergarten exits with primary, junior high schools and senior high schools. One key issue in the district is the increasing cases of worst forms of child labour and child trafficking.

Apam is the capital town of Gomoa West District in the Central Region. It was established in 2008 by LI 1896 following the division of the Gomoa District into Gomoa West and Gomoa East Districts, respectively. It shares common boundary with Ekumfi District to the west and stretches from Gomoa Antseadze in the west to Gomoa Bewadze in the east, North-West by Ajumako-Enyan-Essiam District, North by Agona East District, East of Effutu Municipal and lies south along the Atlantic Ocean. The capital is 68km to Cape and 69km to the National Capital. The people of Gomoa West District are 135,189 representing 6.1% of the population of Central Region. The economic activities in the area include fishing, farming, services and manufacturing. However, fishing constitutes the major economic activity for the fishing towns (Mumford,

Apam, Mankoadze, Abrekum and Dago) along the coast, employing about 5000 fishermen and 2500 women. Health facilities are spread across the towns in the District providing health care services. The District has access to 343 educational institutions, including 126 pre-school, 132 Primary, 77 Junior High and 8 Senior High Schools. Fante is their main Language spoken widely in the District (GSS, 2014c).

Lastly, Mfantseman Municipal is found south of the Atlantic Ocean, and shares boundary West of Abura-Asebu-Kwamankese District, North-East by Ajumako-Enyan-Essiam District, East by Ekumfi District. Its capital is Mfantseman also called Saltpond. The Municipal has a population of 144, 332 persons representing 6.6% of the population of Central Region. Fante is the principal Language spoken in the Municipal. schools. Health and financial facilities are abound providing services within and outside the Municipal. Trading is the major economic activity carried out in Mankessim however, due to its geographical locality, the Municipal has rich fishing activities found along the coast of Mankessim, Abanze, Biriwa, Anomabo, Saltpond and Kormantse. The Education sector of the area include pre-school, primary, junior high schools and Secondary/Vocational/Technical Schools (GSS, 2014d).

Population

The population included all public basic schools (237) in Effutu, Awutu-Senya West, Gomoa West and Mfantseman of Central Region of Ghana. Out of the target population, children between the ages of 5-17 years who have been enrolled in school by their parents and currently in either kindergarten, primary or junior high schools formed the population of the study. The study chose ages between 5-17 years because according to Ghana Living Standard

Survey of round 6, over 2 million children in this age bracket are not just working for few hours a day but engage in activities that seems to compromise their future returns in human capital formation. Table 3 shown below indicates a detailed information on total number of public schools in each municipal/district in the four selected areas in Central Region of Ghana.

Table 3: Population of Schools in the four selected Municipals/Districts in Central Region of Ghana

Municipal/District	Circuit	Schools	Total
Effutu	Effutu Central	8	22
	Effutu West	4	
	Effutu East	10	
Awutu-Senya West	Awutu	9	60
	Ayensuako	7	
	Bawjiase A	8	
	Bawjiase B	7	
	Bontrase	8	
	Jei-Kodua	5	
	Senya	10	
	Obrachire	8	
Mfantseman	Anomabo A	10	79
	Anomabo B	9	
	Dominase	14	
	Mankessim A	9	
	Mankessim B	8	
	Saltpond A	7	
	Saltpond B	13	
	Yamoransa	10	
Gomoa	Adaa-Ngyeresi	9	76
	Ankamu	9	
	Apam	6	
	Odina-Oguaa	9	
	Mumford	8	
	Dawurampong	9	
	Eshiem	9	
	Mprumem	10	
	Tarkwa	7	
Total	**28**		**237**

Source: Akrono (2020)

Sampling Technique and Sample Size Determination

Based on the characteristics and the purpose of the study, a multi-stage sampling technique was adopted. First, a purposive sample schools of 63 was

chosen from their respective circuit. The selection criteria was based on their geographical location to the coast and also child labour is found to be predominant in these areas (GoG, 2015). In all, 23, 076 pupils were obtained in the 8 circuits. According to Isreal (1992) sample size determination, 394 within a precision of ±5% was obtained from the population.

Consequently, 788 pupils were selected in order to increase higher degree of precision and validity (Sarantakos, 2013). Secondly, to obtain the sample size for each school, individual school population was divided by the overall total population of pupils multiplied by the overall sample size. Thus, each school in a particular circuit was random sampled to obtain a specific number of pupils to be interviewed. Thirdly, by the support of the class teacher, the pupils considered to form part of the study were screened based on the condition that at least the child voluntary engages in fishing activities or at least one parent of a child is engaged in fishing activities. Finally, a purposive sampling technique was adopted to select the children for the study.

The researcher then traced the child's residence to the household. Hence, the child formed the unit of analysis. Through purposive sampling technique, an aggregate of seven hundred and eighty-eight (788) children were studied. However, due to the fact that the child human capital accumulation also depended on household factors, two adults (biological/non-biological parents) and head teachers were also purposively included in the study. In addition, head teachers served as informant with regards to the child's school academic performance. The aggregates were obtained in such a way that demand for representativeness and generalisation was not trembled upon.

The sampling techniques were chosen in view of the following determinants: the underlying methodology, the nature of the study object, time available and resources, nature of data required and the time frame of the study. One key point of the multi-phase sampling is that it offers an advantage over other methods, because the information gathered at each phase helps the researcher to focus on the selection more effectively and constructively in later phases. Table 4 shows detailed information on sample size determination in each school selected in the four study areas in Central Region of Ghana.

Table 4: Sample Size Determination of Schools in the Study Area

Municipal/ Districts	Circuit	Schools	Population	Sampled Schools
Mfantseman	Anomabo A	1	667	23
		2	408	14
		3	366	12
		4	213	7
		5	319	11
		6	267	10
		7	413	14
		8	190	6
		9	154	5
		10	435	15
	Anomabo B	1	96	3
		2	280	10
		3	304	10
		4	143	5
		5	135	5
		6	128	4
		7	121	4
	Saltpond A	1	253	9
		2	377	13
		3	259	9
		4	241	8
		5	418	14
		6	77	3
		7	433	15
		8	513	18
		9	359	12
Awutu-Senya	Awutu	1	432	15
		2	302	10
		3	457	16
		4	285	10
		5	512	17
		6	384	13
		7	260	9

Table 4 Continued

Municipal/District	Circuit	Schools	Population	Sample
	Senya	1	356	12
		2	274	9
		3	597	20
		4	1226	42
		5	406	14
		6	408	14
		7	754	26
		8	337	12
		9	223	8
		10	383	13
Effutu	West	1	1397	48
		2	445	15
		3	960	33
		4	503	17
Gomoa	Apam	1	255	9
		2	500	17
		3	523	18
		4	233	8
		5	572	20
		6	290	10
	Mumford	1	309	11
		2	310	11
		3	313	11
		4	119	4
		5	276	9
		6	291	10
		7	455	16
		8	110	4
Grand Total			**23,076**	**788**

Source: Akrono (2020)

Sample size of each school $= \frac{school\ population}{total\ population} * overall\ sample\ size$

Instrumentation

The main source of data for the study was primary data. The primary data was obtained by means of detailed structured interview schedule. The study was quantitative approach and for that matter structured interview was appropriate to obtain information. Structured interview schedule employed structured questionnaires which were verbally presented to the respondents, with the responses recorded in the questionnaire by the researcher.

Hence, the detailed structured interview was used to elicit in-depth verbal information concerning child labour-human capital formation trade-off from each household consisting of the father, mother, or guardian and at least a child. Head teachers formed the informant. Strict adherence to the order and wording of the questions were also incorporated. The researcher kept the same tone of voice across the interviews, offering a consistent impression to the respondents and showed no personal interest in the research topic. All these were done to minimise bias because whatever is in the interview guide was asked without variation and achieve some degree of objectivity and uniformity. The detailed structured interview with questionnaire was developed by the researcher in accordance with the purpose and objectives of the study in line with GLSS of round 6 (GSS, 2014) and ILO (2007). The study employed three broad variables in accordance to the theoretical and empirical literature reviewed, as well as having the possibility of influencing child labour and human capital formation. The variables included child labour variables, household characteristics, child characteristics and school characteristics, respectively. In view of the chosen variables, three kinds of questionnaires were administered, namely; household factors questionnaire, child factors questionnaire and school factors questionnaire. First, the household questionnaire considered two sections: parents' demographic background and household economic characteristics. Second; child characteristics had five sections: bio data, educational background, work activities; and occupational hazard/health and basic cognitive skills ability. Thirdly; school characteristics had two sections: school quality indicators and assessment of pupils. See Appendix A for the detailed study of the questionnaire guide.

Validity of the Research Instruments

To measure the relevance, precision and relatively accuracy, the instruments were prepared and modified in line with GLSS-6 of child labour report (GSS, 2014) and ILO (2007) household questionnaire. In addition, the quality indicators of school characteristics were adopted from the National Inspectorate Board of Ministry of Education. It measured what it is supposed to measure by incorporating the quality standard of indicators of the aforementioned National Data. Thus, reflecting the essential value of the study. Indicators such as 'child labour', 'hazardous work', 'child age bracket' and index for long hours of child labour activity' have been already defined in the GLSS child labour report (Round 6). This framework guided the construction of the research instruments to ensure internal validity.

Validity of the instruments in terms of content and construct validity were of great importance, since the research study was relatively quantitative paradigm. The content validity measured all possible dimensions of the research on child labour-education trade-off, whilst, the construct validity was also considered in the instruments to validate the theoretical foundations of child labour. Pre-test of the study instruments was conducted at Komenda Edina Eguafo Abirem Municipal on ten household units who were not part of the sample size. The pre-test was done to help solve mechanical and ambiguous items that gave clarity of the instruments. A Cronbach's alpha coefficient of 0.72 (Appendix F) was obtained which indicates an acceptable level of reliability.

Ethical Considerations

In order to satisfy all ethical issues in the study, the three set of structured interview schedules and the research proposal were submitted to the Office of the Institutional Review Board, (IRB) of University of Cape Coast for ethical clearance. The purpose is to ensure clarity of information, privacy, anonymity and confidentially. Another consent was cleared from the Regional Directorate of Ministry of Education and Ghana Education Services in the various study areas. Parents (not necessarily biological) of the children were also given letters to inform them about the study.

Respondents were given clear and adequate information regarding the nature of the research instruments and possible benefits of the research procedure. In this case, the respondent had the right to declare or refuse to take part of the study. Discontinuity or withdrawal right of the interview process was assured to respondents at any time. Questions that seemed to pose harm, stress, discomforts, loss of self-esteem, guilt, anxiety or embarrassment in terms of psychological trauma were also considered. The questions were clear and precise for respondents to provide responses to them.

Furthermore, no respondent was coerced in any form to take part in the study. Privacy, anonymity and confidentiality of ethical standard was guaranteed in the study. Interview schedules did not bear respondents names. However, household identification numbers were given, but information was linked to any particular respondent. Therefore, data were handled by the researcher alone to ensure confidentiality.

Data Collection Procedure

The data was obtained through field survey of respondents within the four study areas in Central Region, namely; Gomoa West, Awutu Senya West, Mfantseman and Effutu. The field study commenced on April 2018 with three field assistants employed to facilitate the data collection process. In a separate time schedules, two parents (not necessary biological) responded to demographic and household characteristics, whilst the child responded to child characteristics instruments and the headteacher was interviewed for child academic performance.

The administration of the instruments lasted for four months between the months of Apri-July, 2018, from Monday-Saturday daily. Pupils of various schools were interviewed between the hours of 7am-3:00pm of Monday-Friday daily and then their respective household unit were traced for subsequent interview. To avoid biasness, at separate times/occasions, parents were interviewed and obtained detailed responses concerning household characteristics. Concerning the child instrument, questions such as school attendance and cognitive skills development were provided by the head teacher. The class attendance register was used to identify the regularity of children's school attendance, whilst, information was teased out from school reports and continues assessment to obtain responses for cognitive skills development.

Measurement and Specification of Variables

Dependent Variables

The first dependent variable is child labour, defined as: participation and intensity of work. Child labour participation in fishing and its related activities (*clpart*) are those children (5-17 years) who are in productive work or involved

in economic work in fishing and its related activities that span through the week during the referenced period of the study. By definition, if the child is involved in at least one of the categories: engaged in hazardous economic work or economic activity or worked for at least one hour. Hence, by virtue of its definition child labour participation becomes dummy variable, measuring 1 as participation in fishing related activity or otherwise. (GSS, 2014).

The second form of child labour is the intensity of child labour, also known as the child labour hours (*clhrs*). Child labour hours is the total average number of hours the child spent working within the days of the week. Holgado et al. (2014) suggest that there is a link between hours of work and schooling investment and evidence shows that even in minimal hours of work is likely to have negative implication to the child future human capital accumulation. For that matter considering hours of work, it is of great importance in analysing schooling issues. Child labour hours is continuous variable measured in terms of total hours spent working in any of the fishing related activities per 5-days in the week.

The second dependent variable is the educational outcomes in terms of school attainment (schooling for age) and cognitive skills ability. The first part of educational outcome is grade-age-adjusted school attainment or schooling for age (*sage*). According to OECD (2013), educational attainment is a measure of human capital and the level of individual skills acquired. Thus, it could be deduced that school attainment is the quantitative years in schooling. In this study however, school attainment follows Psacharopoulos and Yang's (1991) calculation, in a categorical form. It measures school attainment with respect to

grade (class) and age adjustment outcome. This represents as: SAGE (schooling for age).

$$\text{SAGE} = \frac{years\ of\ schooling}{actual\ age - entry\ age} * 100$$

Where years of schooling is the highest class attained by the child during the referenced period of the study; actual age is the age of the child as at September and entry age is the official school entry age. It is further explained that the Basic Education System officially enrol child at age four by September beginning the academic year in kindergarten one and by the end of junior high school, the child would have attained 15 years of age, all things being equal. Therefore, if SAGE = 0, it indicates that the child is not progressing or no schooling; between 0<SAGE<100 (less 100) means below normal school attainment or overage in its normal class and that the child is falling behind in formal education; a score of 100 shows normal progress of school attainment, meaning at official grade and age; and more than 100, indexed under-age grade school attainment for the child or progress of child above the age and class. Therefore, this categorisation suggests ordinal outcomes, which takes 4-ordered measurement. Notwithstanding, zero attainment means the child has not been to school before, therefore, the 4-ordered measurement of SAGE is converted to two ordered format variable that takes 1ess than 100: over-age in class of attainment (1) or otherwise (0) for official – age of normal attainment.

Cognitive Skill Ability (*cognitive*) is the second part of the educational outcome. Cognitive skill development is the daily process by which teacher assesses pupils' progress on learning instruction based on the set target in accordance to the educational curriculum. Cognitive skills development also known as school academic performance could be teacher-made test or

standardized test. Teacher-made-test is measured by continuous assessment and Basic Examination Certificate Examination (BECE) forms the standardized test. Each kind of test is unique for which its structure of administration, scoring and interpretation differ.

Over the years, alternative measures of learning outcome have been adopted. Like Khanam and Ross (2011) measured learning outcome in terms of school attendance. ThuLe and Hosmel (2015) on the other hand used test scores to test innate ability, but only a fraction of the children in the sampling clusters took the test. The study therefore, cannot adopt this trend because the children are currently in school and using BECE results becomes impossible to obtain. Hence, a more appropriate measure for this study is the 'teacher-made-test' which measure every child academic progress and performance daily per term in the academic year. The daily academic performance captured the three core subjects, namely; English Language, Mathematics and Science. End of term test scores in the three consecutive terms was aggregated to obtain the average score that represent the cognitive skill ability (Holgado et al., 2014).

The third dependent variable is child health outcome. According to Grossman (2000), health is a stock of capital for which individuals are born with, which depreciate through life. The child early entry to labour market may fall prey to great health risk and increase health stock depreciation, leading to short or long-term fatality (Nicollela & Kassouf, 2018). Health is difficult to measure accurately, and because of that most research works focus on long-term effect of health outcome (Nishijima et al., 2015). However, due to the fact that this study is of short duration, we follow the short-term period to examine the effect of risk on health outcome (Sundjo et al., 2016). The GSS Child Labour Report

(2014) has listed number of work-health related hazard leading to injury/illness. These include: exposure to extreme temperature, dust, fumes, waves, gas, flames/fire, dangerous tools, lake/ponds/sea, poor ventilation, work underground or at height, explosives and noise vibrations. These aforementioned health risk may result in adverse health outcome of extreme fatigue, eye irritation, breathing problems, skin problems, fractures, fever and burns. Hence, the study adopts self-reported illness, based on at least one of the indicators mentioned above. Following Sundjo et al. (2016), self-reported illness takes the binary format as illness (1) or otherwise (0).

Explanatory Variables

Household Characteristics

Household is the bedrock of society and for that matter parental factors are found to impact on the decision on schooling or labour. The household is the child's immediate influence of living in society. Tremendous significance have been placed on the role of household factors affecting the child's welfare in the literature. Below are few variables considered to explain child labour-human capital formation trade- off.

Parental Education

Parental education is a characteristic that is likely to influence the decision to send child to work or school. Evidence shows that parents with higher education are more likely to send their child to school since they understand the value and the role that schooling plays from personal experience (Soares et al., 2012; Emerson et al., 2014). Hence, following Soares et al. (2012), parental education of father and mother was measured as: No Schooling

(0), Primary Education (1), MLSC/Junior High Education (2), Senior High/Voc./Tech (3) and Tertiary (4).

Labour Market Participation

Regarding labour market participation, working or the potential to earn an income gives parents empowerment. For example, women's say is captured by her contribution to the household resources. Contribution is in diverse ways and amount of income is one of them. However, income generated from employment is viewed as endogenous variable, which is clearly problematic as well as difficult to find a valid instrument (Basu, 2006). Following Doss (2013), participation in labour market was measured as employed (1) or not employment (0).

Household Wealth Proxy Index

Basu and Van (1998) has been instrumental in highlighting household poverty as the factor driven by household decision for child to work and other works such as Sasmal and Guillen (2015) have confirmed the assertion. However, level of wealth is a multi-dimensional phenomenon and has different forms of measurement which is often flawed with complications and errors, especially when the expenditure approach is adopted (Rutstein & Johnson, 2004). In order to minimise errors, the study therefore used an alternative variable; asset ownership which is related to poverty level, as an indicator of household wealth (GSS, 2014). This approach represents a more economic status and easy to measure than that of income, expenditure or consumption approach.

In reference to GSS (2014), asset ownership (in context) of household wealth proxy index captured as productive asset such as ownership of land,

canoe/trawler, paddle, fishing net, twine/hook & eye, outboard motor, oven, fridge/deep freezer, cold store, owner occupier house, vehicle/motor, fishing pond and basic electronics. Since a household would own a particular asset or not, the responses become a dummy; yes or no response order. Thus, the Principal Component Analysis was used to obtain the wealth proxy index into quintiles. Quintile 1: poorest, Quintile 2: poor, Quintile 3: middle, Quintile 4: rich and Quintile 5: richest (GSS, 2014).

Parental Attitude

An index was created to measure parental attitude towards child labour. The indicators included: (1) desire for child to manage fishing business; (2) having no desire to further child's education; (3) parents' view child labour as a vocational training for future job prospects; (4) parents' supervise child labour activities and so it is not harmful. Each question was measured on a dummy scale. Based on the review of literature, a number of options are available in creating an index for parental attitude towards child labour. These include; the principal component analysis, factor analysis and the multiple component analysis (Tuesta, Sorensen, Camara & Haring, 2015). However, since the set of indicators used in measuring parental attitude towards child labour are categorical variables, the study adopted the multiple component analysis to create the index. The MCA is a principal component analysis equivalent to categorical data. The Burt approach to MCA scales the coordinates by the principal inertias.

Household Size

Another intriguing link of child labour and education is household size. Household size appears to be important to the issues of child labour-human

capital formation trade- off (Das, 2012). The literature asserts that a child in child labour makes it possible for another child to be in school. In other words, large families increase the need for growing children to labour in order to meet the subsistence of the household. Holding all factors such as level of wealth, large household size lay behind the need for children supplement of household economic status. Large household size indicates an increased dependency rate on the household resources requiring child labour to rise and consequently affecting educational outcomes (Becker, 1993). In this study, household size is defined as the number of children (biological, foster, house helps) living together in the household. Larger household size reduces children participation in education and progress as well as of reducing household investment in schooling.

Household Head Experience in Child Labour

Household head experience in child labour is likely to influence behaviour towards parental responsibility to child education. The literature asserts that there could be a positive stigma associated with child labour if the parents themselves have had experience on the job during childhood age (Patrinos & Shafiq, 2010). Therefore, positive stigma towards child labour is worthwhile since it inculcates discipline and provides immediate future job for the child. Hence, the child is likely to engage in child labour if the parents have positive attitudes towards the work. Therefore, household head experience was measured as a binary format variable.

Child Relationship to household head

Literature have explored parental altruism by examining the evidence on the nature of the parent-child relationship. Emerson et al. (2014) also

reinforces the likelihood that social factors such that parents with whom child lives is important in the affairs of human capital accumulation. Das (2012), recognises family composition and household decisions about investment in future generations. A child relationship to the parents is either biological or otherwise. Based on this, child relationship considered a dummy variable: biological child or niece or nephew or otherwise.

Child Characteristics

Age of the Child

Age of the child is well recognised in determining child labour, because Understanding Children Work reports, UCW (2016) points out that starting to work at younger age results in forgone earnings when adult. GSS (2014) also had pointed out that child labour increases with age. The GLSS-6 estimates more than two million children engaged in child labour, and a number of them are between the ages of 5-17 years. The choice of age is in order since the minimum age to start light work begins at 15 years (Children's Act, 1998). The age of the child was measured by the number of accumulated years as at September.

Sex of the Child

Gender consideration appears to be significant factor in most studies and a policy priority for development. The study by Humphries (2003) further points to gender as one dimension that should not be neglected when analyzing child labour issues. Thus, child labour highlights gender differential in work and school participation. It is therefore, worth analysing how boys and girls dominate in a specific work, which could be a useful guide for interventions

designed to close gender gap. By conventional measure, gender took a binary format.

Nature of Work

Nature of work forms the third part of the child labour variable and it was chosen because not all activities could be termed as child labour, as some work develop the children into productive adult (Morrow & Boyden, 2018). According to ILO (2013), GSS (2014), and Children Act 560 (1998) are two major work areas for children in labour market, and these are: light work (non-hazardous) and hazardous work activity. Accordingly, hazardous work forms of child labour is defined as work designated by National Legislation (GSS, 2014). At least any one of the three categories is viewed that the economic activity is hazardous work. These are: deep sea fishing, fishing processing (smoking), carrying or pulling of heavy loads, diving into the sea to disentangle net from tree stump, handling sharp or pointed object are regarded as hazardous (Children Act, 1998). Based on the aforementioned list, at least one of the child's involvement in any working category is hazardous (1) or otherwise (Holgado et al., 2014).

Empirical Model Specification and Estimation Techniques

Probit Regression Model for Parental Attitude and Child Labour

The first empirical analysis is designed to test the hypothesis relating to parental attitude on child labour. The hypothesis to be tested is: positive parental attitude towards child labour does not influence child labour in fishing and its related economic activities. The dependent variable is child labour participation. Since the dependent variable is qualitative in nature, the probabilities regarding child labour participation can be modelled as a function

of independent variables (Greene, 2012). Referring from the theoretical and empirical literatures of the study, it is well acknowledged that household and child characteristics have effect on the activities of the child. Specifically, the focus variable was the parental attitude towards child labour, followed by the control variables; father's educational attainment, father's employment status, mother's educational attainment, mother's employment status, household wealth, household size, household relation with child and sex of child. This we represent as:

clpart = *f*(attitude, medu, fedu, mocc, focc, hwealth, hsize, relation, sex)……..……..…(1)

Where *clpart* is defined as the participation of fishing and its related activity or non- participation in accordance with Borga (2019). Participation was adopted in the sense that it is connected with incidence of child labour. Since the child participates in an economic activity related to fishing or otherwise, the *clpart* becomes a 'Yes' or 'No' response order. Hence, the response variable is a dummy or binary choice, 1 representing positive response and 0 for otherwise.

Greene (2012) suggests that models where the dependent variable is qualitative, the objective is to find the probability of occurrence. Such probability models include linear probability model (LPM), logistic/logit model and probit/normit model. The linear probability model poses some problems such as non-normality of the disturbance term, non- fulfilment of $0 \leq E(Y_i|X) \leq 1$ and questionable goodness of fit of R^2. The probit and logit models are the two appropriate models suitable for binary dependent variable. Both models play the same role but differ in their tails. Therefore, the study adopts probit model by choice due to its convenience and simplicity in computation. The probit

regression model sought to draw inferences between the binary dependent variable and explanatory variables that maybe continuous, discrete, dichotomous or mix. The generic probit model is:

$\Pr(Y = 1|x_1, x_2, \dots, x_k) = \theta(\beta_0 x_0 + \beta_1 x_1 + \cdots + \beta_k x_k)$.............. 2

Where the dependent variable Y is binary, θ is the cumulative standard normal distribution function and $x_1, x_2, \dots, x_k$ are the regressors. In the context of the problem, (2) is revised as:

$$Clpart_i = X\gamma_i + \mu_i \dots \quad 3$$

$Clpart_i$ denotes whether a child participates in fishing and its related activity or otherwise, x_i is the vector of exogenous determinants including parental attitude, γ is the coefficients to be determined and μ_i represents any unpredictability regarding child labour participation. Therefore,

$$\Pr(Clpart_i|x) = \gamma_0 + \gamma_1 attitude + \gamma_2 Medu + \gamma_3 Fedu + \gamma_4 Mocc + \gamma_5 Focc + \gamma_6 Hwealth + \gamma_7 Hsize + \gamma_8 Relation + \gamma_9 sex + \mu_i \dots\dots\dots 4$$

However, since child labour is a choice variable, the regressors may be correlated with the residual (unobserved variable) in the model. To obtain consistent and efficient estimates that may avoid endogeneity bias, one way is to adopt IV probit model. Therefore, the empirical model employs a two-step estimation procedure that involve instrumental variable. Specifically, the two-stage least squares. Thus, the estimation requires valid instruments in the data set that could solve the endogeneity problem. Inspection from the data set revealed that household head experience in child labour was appropriate for estimation. It satisfies the condition that household head experience in child labour is a determinant of child labour participation through parental attitude (Patrinos & Shafiq, 2010). The empirical model estimated is then specified as:

$attitude_i = \beta_0 + \beta_1 HHDCL^* + \vartheta_i$…….. 5

$$Clpart_i = \gamma_0 + \gamma_1 attitude' + \gamma_2 Medu + \gamma_3 Fedu + \gamma_4 Mocc + \gamma_5 Focc + \gamma_6 Hwealth + \gamma_7 Hsize + \gamma_8 Relation + \gamma_9 sex + \mu_i$$……..…..6

Where (5) is the first stage regression and (6) is the second stage regression. Given the well acknowledged difficulties of interpreting the coefficients of probit regression model, we generate and interpret the average marginal effects. The average marginal effect is the average individual in the sample, which could be expressed as:

AME= $\frac{1}{n}[\frac{\partial P(X)}{\partial xi}] = \Lambda\, f(\gamma_0 + X_i\gamma)\gamma_j$ ……..…….7

Its interpretation follows that a small change in any of the explanatory variables changes the probability that participation in child labour activities takes the value one by X%. In other others, child labour participation in fishing and its related activities changes by an average marginal in any of the explanatory variables, other factors are held constant.

Additionally, the study considered other test of significance in order to show how well the model fit. Greene (2012) suggests that the conventional measure of goodness of fit, McFadden likelihood ratio test or the pseudo R-squared ranged from 0 to 1 has an intuitive appeal in that it if R^2 =1(as $\beta'x \rightarrow +\infty$ or-∞) means the model fit perfectly well, but in reality, it indicates a flaw in the model, considered not a good fit. However, the boundary has no natural interpretation in binary regress and models. Hence, the pseudo R^2 between 0.2 and 0.5 are considered quite satisfactory (Tabachnick & Fidell, 1996).

Also, the specification linktest shows the correctly specified dependent variable on the explanatory variables, thus, squaring the predictor should not have any

explanatory power. The variance-inflating factor ranges from 1 to 10 shows how the variance of an estimator is inflated by the presence of multicollinearity. The more highly correlated a variable the greater its variance. Thus, if the mean of the VIF is more than 10, means there is collinearity. In addition, omission variable test taking care of specification error was also performed to ensure that all the relevant variables are incorporated in the estimated models. An insignificant behaviour shows a well fitted model.

The a priori expectation for the effects on child labour participation in fishing and its related activities would be that, household and child variables are likely to possess either positive or negative expectation on child labour participation in fishing activities. For example, the positive attitudes of parents is likely to increase the incidence of child labour. Likewise, in terms of gender the a priori signs might be either positive or negative.

Probit Regression Model for Child Labour and SAGE

The second empirical analysis is designed to test the hypothesis relating to child labour and educational outcome. The first part of the empirical analysis examines the effect of child labour on SAGE. Generally, SAGE is calculated as the number of accumulated years of schooling which follows Psacharopoulos and Yang's (1991) calculation. This calculation is continuous in nature and for that purpose, linear regression estimation becomes appropriate. Nevertheless, it is acknowledged in the literature of Khanam and Ross (2011) of its ordered nature of response. Therefore, SAGE takes values in the range of zero to 100+ and its interpretation follows that a score below 100 is considered as "over age and less progressing"; 100: "at official age and normal progressing" and 100+: "under age and above normal progressing".

We therefore, collapse the three categories of SAGE into two as Over-aged in grade of school progress and Official-aged in grade of school progress (Khanam & Ross, 2011). This was chosen because the study was interested in children who are over aged in class or otherwise. Therefore, the variable assumes a binary choice of the form: Over-aged in grade (1) or otherwise (0). Hence, Greene (2012) suggests that such dependent variables estimate the likelihood of an event happening. The estimation model that one could best adapt in place of logit model from the CDF is the Probit model. Hence, the general specification model follows as:

$Y_i = \beta_i X_i + \mu_i$……1

Where X_i is the school, household and child variables of the ith child.

The latent-variable approach is:

$Y_i = 1$ if $Y_i^* \geq 0$ or $Y_i = 1$ if $Y_i^* < 0$ ……..2

Y =1, if the child is over-aged in grade or Y = 0 otherwise.

From eqn (1) and (2), it is assumed therefore that there is a critical or threshold level of index (I_i^*), such that if $I_i > I^*$, the child is over-aged in school or otherwise. The threshold I_i^*, like I_i is not observable, nonetheless given the assumption of normality, the probability that $I_i^* \leq I_i$ is derived from the standardised normal CDF as:

$P_i = P(Y = 1|X) = P(I_i^* \leq I_i) = P(Z_i \leq \beta_1 + \beta_2 X_i) = F(\beta_i X_i + \mu_i)$……..…3

Where P(Y =1|X) is the probability that the child would be over-aged in grade of school progress given the set of explanatory variables and Z_i is the standard normal variable, $Z \sim N(0, \sigma^2)$. *F(.)* is the standard normal CDF, equation (3) is represented as:

$$F(I_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-z^2/2} dz$$

$$= \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_i + \beta_2 X_i} e^{-z^2/2} dz$$

Since P is the probability that child would be over-aged in grade of school progress, the probability of being over-aged in grade is measured by the area of the standard normal curve from-∞ to I_i. Obtaining information on I_i, the latent variable becomes an inverse of equation (2), such that:

$I_i = F^{-1}(I_i) = F^{-1}(P_i) = \beta_1 + \beta_2 X_i$……..…4

The binary choice model is maximised as the probability of observing Y conditional on X and may represent in the form: $P_r(Y|X) = [F(X_i\beta)]Y^i\ [1 - F(X_i\beta)]^{1-Y_i}$, $Y_i = 0, 1, 2, \ldots$ ……..5A

The log-likelihood for observation *i* may be written as

$l_i(\beta) = Y_i \log[F(.)] + (1 - Y_i)\log[1 - F(.)]$…….……5B

Interpreting probit effect of a unit change in any of the explanatory variables (X) on the probability that a child is over-aged in grade of school progress (Y =1) is the derivative of equation (2):

$\frac{\partial E[Y|X_i]}{dX_j} = f((\beta_0 + X_i\beta)\beta_j$……...6

Where $f((\beta_0 + X_i\beta)$ is the standard normal probability density function, which is always positive.

Empirically, the probit regression is then specified as:

$SAGE^{*}=\beta_0+\beta_1 clpart + \beta_2 medu + \beta_3 mocc + \beta_4 fedu + \beta_5 focc + \beta_6 hwealth + \beta_7 relation + \beta_8 SchQ + \mu_i$ … … … … … … … … … … 7

$$P_r(SAGE = 1) = \beta_0 + \beta_1 clpart + \beta_2 medu + \beta_3 mocc + \beta_4 fedu + \beta_5 focc + \beta_6 hwealth + \beta_7 relation + \beta_8 SchQ + \mu_i \ldots\ldots\ldots\ldots\ldots 8$$

In addition, it is acknowledged that child labour is a choice variable which depend on several observed and unobserved factors. Thus, since Sage and child labour are dummy, bivariate probit was adopted to solve for the endogeneity. Below is the structure of the empirical model:

$$Clpart_i = \pi_0 + \pi_1 nwork^* \ldots\ldots\ldots 9$$

$$Sage_i = \beta_0 + \beta_1 Clpart + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 SchQ + \mu_i \ldots\ldots\ldots\ldots 10$$

$$Prob[C = 1, S = 1] = \beta_0 + \beta_1 Clpart' + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 SchQ + \mu_i \ldots\ldots 11$$

Where it is observed that the child is likely to be over-aged in grade attainment or not, given the range of explanatory variables: child labour participation, father's educational attainment, mother's educational attainment, mother's employment status, father's employment status, household wealth index, household's relationship to child and school quality. In estimating the average marginal effect, one can evaluate the expressions at the sample means of the data or evaluate the marginal effects at every observation and use the sample average of the individual marginal effects. The average marginal effect expressed indicates the effect of a unit change in household or child or school factors on the probability that a child would be over-aged in grade-age of school attainment, holding all other variables constant.

Linear Regression for Child Labour and Cognitive Skills Ability

The second section of the empirical analysis of objective two estimates the effect of child labour on child cognitive skills ability. The cognitive skill ability also known as learning outcome is a measure of the basic stock of skill formation. Therefore, at the basic level the skill formation indicates the average test scores in the academic year in three core subjects, namely; Mathematics, English Language and General Science. The nature of the independent variable is numeric, and by conventional measure, Ordinary Least Squares estimation becomes necessary for estimation. This is modelled as:

$Y = \beta_0 + \beta_1 X + \mu$ ……..……1

Where X is the explanatory variables; Y is the dependent variable, μ, known as the disturbance term, or error term, is a random variable that has well-defined probabilistic properties and it is assumed not correlated to the X variables. Other assumptions according to Gujarati and Porter (2009) follows that, the regression model is linear, no omitted explanatory variable, zero mean value of the disturbance term, constant variance, the observation is greater than the parameters to be estimated and no autocorrelation between the disturbance term. As it is known, the OLS estimator is said to be best linear unbiased estimator, having minimum variance. Hence, for estimation purposes, the theoretical model is transformed to empirical model as:

$Cognitive = F(clpart, medu, fedu, mocc, focc, hwealth, relation, schq)$……..……..…2

$$Cognitive = \beta_0 + \beta_1 clpart + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 SchQ + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

The dependent variable in this study is the cognitive skills ability measuring the human capital stock through innate basic skills embodied within the child in the academic year measured. The factors considered to control cognitive skill ability included: child labour participation, household wealth, father's educational attainment, mother's educational attainment, father's employment status, mother's employment status, household relationship to child and school quality. Thus, the model could be used to predict the effect of the explanatory variables on the cognitive skills ability embodied in the child in the academic year.

However, as indicated before, child labour is not randomly assigned, hence the potential for the estimates from the OLS model to suffer from bias. Thus, the study employed the propensity score matching technique to address this challenge. This technique of dealing with consistency and bias compares the child labour participation in fishing and its related activities with their counterfactual group. The generic structure of the equation is defined as:

$$P(X) = P_r\{T = 1|X\} = E\{T|X\} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

Where P(X) is the conditional probability of receiving treatment given the pre-treatment characteristics, T = {0, 1} is the treatment indicator, child labour participation or otherwise, and X is the vector of pre-treatment characteristics. Furthermore, the Average Treatment on Treated (ATT) estimates the propensity score matching model and it is expressed as:

$$ATT = E[Y_i^1 - Y_i^0 | T_i = 1].$$

$$= E\begin{cases} E[Y_i^1|T_i = 1, P(X_i)] \\ -E[Y_i^0|T_i = 0, P(X_i)] \\ \qquad T_i = 1 \end{cases} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

The $P(X_i)$ is the propensity score (P-score), Y_i^1 and Y_i^0 are the outcomes in the two counterfactual situations of receiving treatment (child labour participation in fishing and its related activities) and no treatment (non- child labour participation in fishing and its related activities. Generally, there are various matching techniques used to compare the p-score of child labour participation or otherwise and to further estimate the ATT. This study adopted the common matching and for robustness checks, the Kernel matching and linear regression matching were also used.

However, the empirical model employed above is a two-step estimation procedure that involved two assumptions to ensure propensity score matching validity, namely; common support condition and balancing property assumptions (Huber, Lechner & Wunsch, 2013). The common support condition assumption requires that the standardized difference in the mean propensity score and the covariates in the two groups should be near zero. Thus, the observations of the covariates of children who participate in child labour (treated group) should be similar to children who do not participates in child labour (untreated group). In addition, the balancing property assumption establishes that the level of reduction in bias of the various covariates after matching must be passed. That is the Rubin's B should be less than 25% whilst the Rubin's R criteria must be satisfied and lie within an acceptable range between 0.5- 2 (Rubin, 2004).

Bivariate Probit Regression for Child Labour and Child Health Outcomes

The third empirical chapter of the objective three estimates child labour on child health outcomes. The child health outcome is the dependent variable

measured in terms of extreme fatigue and breathing problems. Extreme fatigue is defined as: child suffers extreme fatigue or otherwise. Whilst breathing problems is defined as: child suffers breathing problems or otherwise, making them a dummy variable. Since the nature of the variable is binary, by conventional measure, probit model becomes necessary for estimation. The key variables are child labour participation and intensity of child labour. This is followed by control variables: household factors and child characteristics. This represents:

$Y_i^* = X_i\beta + \mu_i$…….. 1

The latent-variable approach is:

$Y_i = 1$ if $Y_i^* \geq 0$ or $Y_i = 1$ if $Y_i^* < 0$ ……..2

Y =1, if the child suffers extreme fatigue as one outcome and suffers breathing problems as another outcome or Y = 0, otherwise. The empirical estimation becomes:

$$Fatigue_i = \begin{cases} 1 \; if \; Fatigue_i^* > 0 \\ 0, otherwise \end{cases}$$ ……..……3

$$Breathing_i = \begin{cases} 1 \; if \; Breathing_i^* > 0 \\ 0, otherwise \end{cases}$$ ……..4

However, child labour variable cannot assume random response, but inherently considered as endogenous. In view of that, μ_i and Y_i^* are correlated and probit estimations of 3 and 4 become inconsistent. We move on to the second stage and the appropriate framework employed was bivariate probit regression analysis. It seeks to find the joint probability of a child engages in child labour, with the probability that he/she suffers from extreme fatigue and

breathing problems. It then becomes possible that some characteristics could influence both child labour and child health (Greene, 2012). In view of this, two dependent variables with possible correlated disturbance becomes necessary. In reference to Greene (2012: 738), the general specification multiple-variable population of bivariate probit regression function is specified as:

$Y_1^* = X_1'\beta_1 + \varepsilon_1$, $Y_1 = 1$ if $Y_1^* > 0$, 0 otherwise……5

$Y_2^* = X_2'\beta_2 + \varepsilon_2$ $Y_2 = 1$ if $Y_2^* > 0$, 0 otherwise……..6

Where $\begin{pmatrix}\varepsilon_1 \\ \varepsilon_2\end{pmatrix} | X_1, X_2 \sim N\left[\begin{pmatrix}0\\0\end{pmatrix}, \begin{pmatrix}1 & \rho \\ \rho & 1\end{pmatrix}\right]$

Y_1^* and Y_2^* are not observed and represent the loss obtained by the household when the *ith* child is working and suffers extreme fatigue and breathing problems, respectively. X_2' and X_1' are the vector of exogenous covariate of household and child characteristics. $\beta_1$and β_2 are the vectors of coefficients of the observed variables. $\varepsilon_1$and ε_2 are the corresponding error terms, assumed to be normally distributed. The above presentation also suggests a correlation coefficient in a bivariate probit model as the conditional tetrachoric correlation indicating existence or otherwise of the trade-off relation. In a case where there is an endogenous variable in the binary choice format due to some omitted variables that are correlated with child health or child health jointly determined with child labour, the model is rewritten as:

$Y_1^* = X_1'\beta_1 + \varepsilon_1$,

$Y_2^* = X_2'\beta_2 + \delta Y_1^* + \varepsilon_2$, $Y_2 = 1$ if $Y_2^* > 0$, 0 otherwise……....7

Where $\begin{pmatrix}\varepsilon_1 \\ \varepsilon_2\end{pmatrix} | X_1, X_2 \sim N\left[\begin{pmatrix}0\\0\end{pmatrix}, \begin{pmatrix}1 & \rho \\ \rho & 1\end{pmatrix}\right]$. (Y_2, X_2) observed only when $Y_1 = 1$, which contains an observation rule, $Y_1 = 1$, and a behavioural outcome, $Y_2 =$

0 *or* 1. The endogeneity of the sampling rule implies that: $prob(Y_2 = 1|Y_1, X_2) \neq \phi(X_2'\beta_2)$.

This equation cannot be estimated, because Y_1^* is not observed. We therefore proxy the variable available in the data set.

But, $L = prob\ (X_1 < x_1,\ X_2 < x_2) = \int_{-\infty}^{X_1}\int_{-\infty}^{X_2} \phi_2\,(z_1, z_2, \rho)dz_1dz_2$, is the likelihood function to be maximised. Therefore, the bivariate normal cumulative density function (cdf) is given by $\phi_2(x_1, x_2, \rho)$, that is

$$\phi_2(x_1, x_2, \rho) = [2\pi(1-\rho^2)^{1/2}]^{-1}\, e^{-(1/2)(x_1^2 + x_2^2 - 2\rho x_1 x_2)/(1-\rho^2)} \ldots\ldots\ldots 8$$

Where the β's are the bivariate probit coefficient, $X's$ are vectors of factors that influence child suffering from extreme fatigue and breathing problems and ρ is the coefficient of correlation between the two equations ($\rho = 0$). Hence, taking the partial derivatives of the log likelihood function gives the maximum likelihood estimator as:

$$\frac{\partial\phi_2(X_1'\beta_1, X_2'\beta_2, \rho)}{\partial X_1} = (X_1'\beta_1)\Phi\left(\frac{X_2'\beta_2 - \rho X_1'\beta_1}{\sqrt{1-\rho^2}}\right)\beta_1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 9$$

The coefficients ($\beta's$) are the partial derivatives or the marginal effects expressed indicating the percentage change in the probability of child that suffers extreme fatigue and breathing problems or otherwise relative to a unit increase in the given explanatory variable, holding all other variables constant. Hence, we develop the empirical framework from (3) and (4) as:

$$Fatigue_i^* = \omega_i'\beta + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 10$$

$$P_r(Fatigue_i = 1|\omega) = P_r(Fatigue_i^* > 0)$$

$$= P_r(\omega_i'\beta + \mu_i > 0|\omega) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 11$$

$$Breathing_i^* = \omega_i'\beta + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 12$$

$$P_r(Breathing_i = 1|\omega) = P_r(Breathing_i^* > 0)$$

$$= P_r(\omega_i'\beta + \mu_i > 0|\omega) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 13$$

Where child labour in the model is defined as child labour participation in fishing related economic activities and child labour hours. Child labour participation in fishing economic activities takes the binary format; and hours of work is the number of hours worked per week. Recall that child labour is being considered as endogenous and so we then instrument child labour with nature of work (hazardous or otherwise), since it may instigate child to work at the detriment of good health. Greene (2012) highlight that at least one instrument is enough for estimation. We present the system in the form:

$$Clpart_i = \pi_0 + \pi_1 nwork^* \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 14$$

$$fatigue_i = \beta_0 + \beta_1 Clpart + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots 15$$

$$Prob[F = 1, C = 1] = \beta_0 + \beta_1 Clpart' + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots 16$$

$$Breathing_i = \beta_0 + \beta_1 Clpart + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots 17$$

$$Prob[B = 1, C = 1] = \beta_0 + \beta_1 Clpart' + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots 18$$

The second definition of child labour (child labour hours) is a continuous variable and for that matter, OLS was appropriate for estimation. Hence, the empirical model:

$$Clhrs_i = \pi_0 + \pi_1 nwork^*$$

$$fatigue_i = \beta_0 + \beta_1 Clhrs + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots 19$$

$$fatigue_i = \beta_0 + \beta_1 Clhrs' + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots 20$$

$$Breathing_i = \beta_0 + \beta_1 Clhrs + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots 21$$

$$Breathing_i = \beta_0 + \beta_1 Clhrs' + \beta_2 Medu + \beta_3 Fedu + \beta_4 Mocc + \beta_5 Focc + \beta_6 Hwealth + \beta_7 Relation + \beta_8 Sex + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots 22$$

The IV estimations is conditional on the validity and relevance of the instrument.

Chapter Summary

The research study covered four study areas, namely; Gomoa West, Senya Awutu, Mfantseman and Effutu, respectively. The study design was the quantitative paradigm dominant with descriptive and analytical survey method. A multistage, with simple random sampling and purposive sampling were the sampling techniques adopted. A detailed structured interview schedule with questionnaire was adopted to solicit information from respondents.

Child labour participation, intensity of child labour, age-adjusted school attainment or Sage, cognitive skills ability and child health outcome were the

dependent variables with household, child and school characteristics variables. Probit, Biprobit, IVprobit, OLS and Propensity Score Matching Models were chosen for estimations in the respective empirical objectives as it relates to the hypothesis.

CHAPTER FIVE

PARENTAL ATTITUDE AND CHILD LABOUR

Introduction

This chapter presents the first empirical objective. The objective of this section is to examine how parental attitude affect child labour participation in fishing and its related economic activities in the Central Region of Ghana. Contrary to the notion that parents have similar preference, this study assumes that parents' attitude differ and consequently examines how such attitude influence the incidence of child labour. The chapter presents descriptive and two models of econometric estimations: probit and IVprobit regression models.

Descriptive Statistics

This section presents the descriptive analysis of the study in line with objective one. It focuses on variables that describes parental attitude, parental characteristics, household characteristics and child labour in the fishing communities of Central Region of Ghana. Table 5 is presented below.

Table 5: Percentage and Mean Distribution of Parents' Attitude, Household Characteristics and Child Labour

Variable	F	Percentage	Mean
Parental Attitude Index		86.75	0.048
Father's Attitude Index			
Dimension 1	708	89.74	0.076
Dimension 2	2	0.25	0.0001
Mother's Attitude Index			
Dimension 1	660	83.76	0.021
Parents Experience in Child Lab.			
Father's Experience *(Yes)*	651	82.61	
No	137	17.39	
Mother's Experience *(Yes)*	678	86.04	
No	110	13.96	
Parental Characteristics			
Mother's Employment Status-	771	97.84	
(*Yes)*	17	2.16	
No			
Mother's Educational Attainment	10	1.27	
No Education	130	16.50	
Primary Education	648	82.27	
JHS/MLSC			
Father's Educational Attainment-	28	3.53	
No Education	675	85.01	
Primary Education	73	9.19	
JHS/MLSC			
Father's Employment Status-(*Yes)*	553	71.5	
No	235	28.5	

Table 5 Continued:

Household Characteristics	**F**	**Percentage**	**Mean**
Wealth Quintiles-Poorest	193	24.49	
Poor	186	23.60	
Middle	197	25.00	
Rich	212	26.90	
Richest	-	-	
Household Size	788		5.730
Minimum Household Size		3	
Maximum Household Size		10	
Household Relationship to Child-Biological	604	76.6	
Foster/Maidservant	184	23.4	
Child labour hours per week			15.7
Child Labour Participation			
Income generating activity *(yes)*	489	62.06	
No	299	37.94	
Mode of payment in the comm.			
Wage payment (in-cash)	479	60.21	
In-kind	309	39.79	
Sex of Child-Male	379	48.01	
Female	409	51.09	

Source: Akrono (2020)

Given the parental attitude in Table 5, the survey elicited information on the investment choice of the household. As a result, a large proportion of fathers (89.74%) in our household sample gave their preference for child labour and 83.76% of the mothers also agreed to the fact that child labour is positive since it inculcates discipline in the child. As indicated, there is a possibility that parental attitude could lead to prevalent of child labour.

Information regarding women source of bargaining power that enhances the ability to bargain in the intra-household decisions was considered and examined. Based on that, the study revealed two basic proxy of bargaining power: employment status and educational attainment. Table 5 revealed that greater proportion of women were economically active. Various kinds of specific occupation included fish processing, fishing trading and distribution, salt mining, cold store management and sale of fishing equipment were found to be the prominent source of employment for women in the study area. Thus, very few of the mothers were unemployed.

Another indicator of woman's bargaining power was the level of educational attainment. The educational background of mothers' is likely to play a significant role in reducing the occurrence of child labour. The educational attainment from the study shows that majority of women (82.27%) had primary schooling and 16.50% at the SHS levels. Although, the educational levels are low, the literacy rate forms 90% of women of households in the Central Region. In addition, father's educational attainment is a component of human capital development and many economists have emphasised its significance on child's schooling, and consequently in nation building. For that matter, there is the possibility that fathers' educational background would also play a significant role in reducing the occurrence of child labour. Following Table 5, the descriptive data shows that fathers have ever enrolled in school before, which reveals higher literacy rate. However, fathers' level of educational attainment was very low, and greater proportion of them have attained only up to the primary level.

Wealth quintile represents the economic status and standard of living in a household. The household wealth quintiles were in five categories, with the first quintile being the poorest household, second quintile: poor, third quintile as neutral, fourth: rich and richest for fifth quintile. General overview of the quintiles show from the study that households have fair distribution of economic standing and that very few parents were found to be very poor. Considerable proportion of households were in fourth quintile. However, there is no much deviation among the distributions of the quintiles.

The household is a unit that accommodates and ensure the serene environment for children. From Table 5, 33.8% parents were living together as husband and wife, while 43.2% parents were separated and 23% parents were found to be single. The distribution shows more parents living together and they are likely to provide better shelter for their children and few parents have separated. The study also revealed the household relationship with child, and this included biological children, foster children and house-helps/maidservant. The household size ranged from at least 3 and at most 10 members and averagely 6 members approximately in a household.

Regarding children's economic activity, the descriptive analysis showed that, 77.5% participate in fishing economic activity and 22.5% do not participate in fishing economic activity. The survey also recorded 15.7 average working hours per week for all children working. Table 5 also presents data on the nature of work and found that 73.43% children were engaged in hazardous work whilst 25.82% were also engaged in non-hazardous work.

Table 5 further shows the distribution of mode of payment of children participated in fishing economic activity in the study area. Quiet a higher

proportion of children (60.21%) said children engaged in child labour activities in various communities receive cash payment for engaging in any kind of fishing related economic activities. Thus, approximately 40% children also receive payment in-kind, in the form of fish which they sell for cash. It was also revealed that most of what the children receive as cash are used for their up-keep.

Gender dynamics was also noted and it is important policy variable in national planning. In reference to Table 5, the descriptive statistics shows that 51.09 percent were female children, slightly higher than male children who were 48.01 percent. The results show fair distribution of sex.

Effect of Parental Attitude on Child Labour Participation

Table 6 contains the results of both the probit and IVprobit regression models of the effect of parental attitude on child labour participation. As indicated in Chapter Four, the results are presented in the form of average marginal effects. The Table also contains the post estimation results for both probit and IVprobit models. The model determined the strength and level of significance of the focus variable (parental attitude) and the control variables; mother's employment status, mother's educational attainment, father's educational attainment, father's employment status, household wealth index, household size, sex of child, child relationship to parents. We therefore discuss Table 6 in detail.

Post Estimation Tests

Before discussing the estimations, it is worthwhile also to confer the robustness of the model. It is noted that the Wald test is significant indicating that parental attitude is endogenous, hence the results of the probit model is

bias. Also, correctly specified linktest was performed and found an insignificance behaviour of the hatsq, which demonstrates that the model was correctly specified. In addition, multicollinearity test was also conducted and 1.97 shows that there is no dependency among the predictors. The F-test also shows that the validity of the instrumental variable is satisfied. In general the model could be considered quite satisfactory (Tabachnick & Fidell, 1996). Greene (2012) mentions that if the model fit perfectly, then it signifies a flaw in the model, considered not a good fit.

Table 6: Average Marginal Effect of Probit Regression: Parental Attitude and Child Labour Participation

	Probit Model	IV Probit Model
Explanatory Variables	**AME**	**AME**
Parental Attitude Index		
Parental attitude towards child labour	0.136***	0.435***
	(0.039)	(0.117)
Mother Characteristics		
Employment status (*unemployed*)		
Employed	-0.096**	-0.064***
	(0.033)	(0.036)
Educational level *(no education)*		
Primary Education	-0.078	-0.074
	(0.095)	(0.086)
JHS/MLSC	-0.209	-0.152
	(0.142)	(0.142)
Father Characteristics		
Employment status *(unemployed)*		
Employed	0.138	-0.108
	(0.107)	(0.102)
Educational level *(no education)*		
Primary Education	-0.255***	-0.257***
	(0.072)	(0.061)
JHS/MLSC	-0.482	-0.439
	(0.096)	(0.097)
Household Characteristics		
Wealth Quintile *(1st Quintile)*		
2nd Quintile	0.011	0.054
	(0.046)	(0.044)
3rd Quintile	-0.089*	-0.049*
	(0.047)	(0.048)
4th Quintile	-0.128**	-0.056*
	(0.047)	(0.057)
5th Quintile	-0.227***	-0.159
	(0.049)	(0.063)
Household Size	0.175	-0.159
	(0.029)	(0.063)
Child Characteristics		
Gender *(Male)*	-0.356***	-0.271***
Female	(0.046)	(0.062)

Table 6: Continued

	Probit	IV Probit
Explanatory Variables	**AME**	**AME**
Relationship to child (*Biological*)		
Foster/ maidservant	-0.016	-0.021
	(0.036)	(0.032)
Post Estimations		
_hatsq p-value	(-0.039)0.580	
F-test of excluded instrument		17.580(0.000)
VIF	1.97	
Wald test(prob>chi2)		3.97(0.046)
Observations		767

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

Source: Akrono (2020)

Table 6 depicts estimates of the average marginal effect of parental attitude on child labour participation. We first discuss the focus variable in the probit model. The result shows that parental attitude towards child labour is significant at 1% and positively signed. The average marginal effect of 0.136 explains that on the average, child labour participation increases by 13.6% margin if parental attitude is positive towards child labour. This implies that a child whose parents have positive stigma is more likely to engage in child labour.

This result is consistent with our prior expectation. In Ghana, just like most African countries, the parents are responsible for the household upkeep including paying of school fees for child's education. Therefore, in instances where the parents view child labour as worthwhile, the child may be motivated to take up the fishing activity as the immediate employment for the future. In other words, where there is no weight attached to child's education, father being

the key decision maker, with the mother also supporting her spouse, all resources would directly be devoted to supply of child labour because work is found to be valuable and more worthwhile.

Theoretically, accumulated knowledge in the historical view of child labour commends child labour activity as necessary for skill training and discipline. Indeed, households attached importance to children in labour and were made very useful by working intensively in key sectors such as textiles in the industrial revolution (Doepke & Zilibotti, 2002). Empirical literature of Tafere and Pankhurst (2015), Morrow and Boyden (2018) and Edoh-Torgah (2018) have noted the positive stigma towards child labour that it teaches children valuable skills and therefore, could be combined with schooling. However, under the human capital theory, a child who receives less schooling is more possible to grow up to become poorer when adult. Following this simple logic expression, the poor adult's child, would also be sent to work, thereby joining the dynastic trap, and perpetuating child labour across generations (Sasmal & Guillen., 2015).

In reference to Table 6 again, we present the IV probit model. Our analysis shows that, the pattern of parental attitude still remains positive and significant at 1%. The result indicates that positive parental attitude is likely to lead to an increase in child labour participation in fishing and its related economic activities. The result throws more light on the theory of child labour in line with Zelizer (1985), who commended that child labour is necessary for character training, discipline and industrial competition. Social norms and positive stigma towards child labour are viewed to yield more benefit (Lindbeck et al., 1999).

Our empirical exercise also established 5% significant level and negative direction of effect of mothers' participation in labour market and child labour participation in fishing and its related activity. The mothers' labour market participation determine the mothers' power within the household decisions and this have a decreasing effect on child labour participation. In other words, child labour participation decreases with the presence of mother working. The coefficient shows that on the average, incidence of child labour decreases by 6.4% when mothers' participate in labour market.

The negative effect of mother's employment status on child labour participation in the current study substantiates Antman (2014). Antman points out that in Mexico, women's participation in labour force is likely to increase significantly in her involvement in making household decisions. This could be seen as a good indicator of her bargaining power within the household. Our finding is also in line with the empirical contributions of de Hoop et al. (2017) who have underscored that the economic capacity of women is likely to have reduction in child labour participation.

Ngengebuke (2016) study of the influence of the mother's power on her child's labour in Nigeria noted that bargaining power within the household is a relevant factor that should be considered in household's decisions. The author went on to say that household income level can have a different allocation of resources and with different decision about investment in child education. Arguably, women participation in labour market enable her potential to generate income and, and for that matter does not make any difference. Afoakwa et al. (2018) also commented that where women have bargaining power, their say increases

in line with their attitudinal preference, and hence child education outcomes increase.

Furthermore, the estimates in Table 6 also shows father's education has effect on child labour participation. Father's educational attainment was significant at 1% and has a reducing effect on child labour participation. The results revealed that on the average a child whose father has attained primary education is less likely to engage in child labour activities by 0.257 point. One of the likely reasons of this finding could be that educational attainment of an individual is a power and may view child's education as wealth or utility maximising asset, consequently the father is more likely to provide the needed financial supports for the child.

The negative effect on child labour participation is consistent with most studies. In a study in Bangladesh, Kumar and Saqib (2017) addressed family background to child schooling and labour market participation, and found that father's education has a significant negative effect on the supply of child labour. Again, the result also confirms other investigation, noted by Mukherjee and Pal (2016) which sought to explore the parental factors on child labour and schooling. Mukherjee and Pal (2016) confirmed that educational level is likely to negatively impact on child labour. As it was expected, the descriptive study found out that 85% fathers have attained primary education. In addition, the finding also agrees with the study of Putnick and Bornstein (2015).

A household variable likely to affects child labour participation is the household wealth. Following Table 6, the stock of wealth proxy index was scaled in five quintiles, ranging from poorest to wealthiest. Indeed, low level of asset and financial base have been the cornerstone of much of the thinking of child labour,

which children work purposely to compliment household income for living (Sasmal & Guillen, 2015; Nordman & Sharma, 2016). The study revealed that children from households whose poverty level is low (3rd, 4th and 5th quintile), have less probability of child participating in fishing related activities. The effect is negative and the level of significance established were 10%, 5% and 1%, respectively. For example, the average marginal effect of 0.128 suggests that on the average, a child from the 4th quintile household is 12.8% less likely to participate in child labour than the household that has high poverty level (1st quintile).

Theoretical literature on child labour gives a compelling evidence that poverty drives children away from schooling, leading to consumption of the child in the present period (Basu & Van, 1998). Many alternative empirical literatures have shown that most children work because of household poverty. It is worthy to emphasize that the theory of Basu and Van (1998) still stands as it corroborates with the empirical literature of Sasmal and Guillen (2015) and Kumar and Saqib. (2017). Hence, the empirical literature on child labour gives an authentication evidence that poverty drives children away from schooling, leading to consumption of the child in the present period.

Differences in Attitudes of Parents and Child Labour Participation

This section presents the results for the effect of both parents' attitude on the supply of child labour (child labour participation). In view of the dummy nature of child labour, probit model was employed and used to determine the strength and level of the significance of the independent variables. Table 7 presents the probit regression of the effect of both parents attitude on child labour participation. In all, 10 predictors: mother's attitude, father's attitude,

mother's employment status, mother's educational attainment, father educational attainment, father's employment status, household wealth index, household size, household relationship to child and sex of the child were used to find the extent of how these variables influence child labour participation. We first discuss the post estimation test.

Post Estimation Tests

Several diagnostic tests were conducted to ensure robustness. To determine whether the model is correctly specified the linktest was performed. The null hypothesis is that there is no specification error. The insignificance of the hatsq also gave further credence that the model was correctly specified. Omission variable test of insignificant probability value shows correctly specified model. The F-test value lies within the acceptable range, and shows that the instrument used was relevance and reliable for estimation. In addition, multicollinearity was measured by variance inflation factor (VIF). As a rule of thumb, variables whose VIF values are greater than 10 could be considered as a linear combination of other independent variables. A mean VIF of 2.13 and 2.15 indicate that there is no perfect correlation among predictors. The Wald chi (prob>chi2) = 4.47 at 5% suggests that the explanatory variables discriminate well between child labour and other variables. In all, the model could be considered quite satisfactory (Tabachnick & Fidell, 1996).

Table 7: Probit and IVProbit Regression Models: Differences in Parental Attitude and Child Labour Participation

Explanatory Variables	Probit AME	IV Probit AME	Probit AME	IV Probit AME
Parental Attitude Index				
Father's attitude			0.003	0.032***
			(0.003)	(0.011)
Mother's attitude	0.005***	0.023***		
	(0.002)	(0.007)		
Mother Characteristics				
Employment status (*Unemployed*)				
Employed	-0.096***	-0.080**	-0.097**	-0.079**
	(0.034)	(0.033)	(0.030)	(0.034)
Educational level (*no educ)*	-0.249***	-0.207**	-0.198**	-0.111
Primary education	(0.080)	(0.090)	(0.086)	(0.103)
	-0.488***	-0.425**	-0.441**	-0.343***
JHS/MLSC	(0.106)	(0.117)	(0.109)	(0.130)
Father Characteristics				
Educational level (*no educ*)				
Primary Education	-0.069	-0.048	-0.087	-0.069
	(0.099)	(0.094)	(0.097)	(0.089)
JHS/MLSC	-0.190	-0.058	-0.204	-0.142
	(0.153)	(0.153)	(0.152)	(0.142)
Employment status *(Unemployed)*				
Employed	0.113	0.067	0.121	0.077
	(0.110)	(0.104)	(0.110)	(0.101)

Table 7: Continued

Explanatory Variable	**Probit AME**	**IV Probit AME**	**Probit AME**	**IV Probit AME**
Wealth Quintile (*1st Quintile*)				
2nd Quintile	-0.007	0.012	-0.012	0.020
	(0.046)	(0.145)	(0.146)	(0.045)
3rd Quintile	-0.094***	-0.042	-0.098**	-0.025
	(0.047)	(0.151)	(0.047)	(0.056)
4th Quintile	-0.136***	-0.132**	-0.240***	-0.116
	(0.048)	(0.067)	(0.052)	(0.080)
5th Quintile	-0.222***	-0.132***	-0.240***	-0.116
	(0.052)	(0.067)	(0.052)	(0.080)
Household Size	0.043	0.040	0.036	0.038
	(0.047)	(0.044)	(0.750)	(0.043)
Child Characteristics				
Sex of Child (*Male*)				
Female	-0.355***	-0.287***	-0.363***	-0.266***
	(0.031)	(0.052)	(0.031)	(0.069)
Relation to child (*Biological*)				
Foster/ House Help	-0.009	0.012	-0.005	0.030
	(0.035)	(0.034)	(0.035)	(0.034)
Post Estimations				
_hatsq	-0.123		-0.137	
	(0.101)		(0.165)	
OV Test (P-Value)			0.167	
Multicollinearity	2.13		2.15	
F-test of excluded instrument		35.170		17.580
		(0.000)		(0.000)
Wald Chi (Prob>chi2)		4.47		4.19
		(0.035)		(0.041)
Observation	767	767	767	

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

Source: Akrono (2020)

In reference to Table 7, similar effect and significance level of the explanatory variables for both the probit and IVprobit regression models were estimated. Table 7 shows that the coefficient of father's attitude towards child

labour remains positive at 1% significance level in the IVprobit model. The 0.032 further indicates that father's positive stigma for child labour participation on the average, increases by 3.2%. The result is not different from mother's attitude towards child labour participation. The estimates in the probit and IV probit are all positively signed and significant at 1%. Indeed, on the average the coefficients show that mother's attitude increases the supply of child labour by 2.3%. The margins differ which shows that the attitude of the father is stronger than that of the mother. Specifically, when the father has positive attitude, the incidence of child labour participation increases.

But how do our findings compare with results from the theoretical and empirical perspective? According to the works of Bourdillon (2017) and Morrow and Boyden (2018), mentioned that parental positive perception of child labour preference on child future career affects the decision on whether to send child to school or child labour. Therefore, child from households where the father does not place much emphasis on formal education, such children are more prone to work for long hours. Perhaps, parents' risk averse nature and as such have developed taste with high expectation in future gains for child labour, because it is an immediate employment. In this preview, focusing on early labour entry reduces resources on child schooling affairs and educational returns.

The theoretical comments by Basu and Dimova (2020) point to this fact, that the parental tastes and preference in line with more risk averse parents are very sensitive to uncertainty environment of education and employment. The author argued that investment is a risky event and so most parents may decide to diversify their investment among several alternatives, and that child labour

maybe one of them**.** Bourdillon (2017) refers the above discussions as social norms and acceptance where parents may have worked as child labourer in their young age, and also likely to encourage their child to work as well.

Table 7 also shows the mother's participation in labour market and her educational attainment level. Referring from Table 7, women's employment status was found to have a negative coefficient and 1% significance level. Though, the study did not make it clear that the woman is in control of her own income, it is worth noting that, both the probit and the IVprobit models found that the employment status of the mother has reducing effect on the child's likelihood of engaging in child labour. The study notes that mother's employment status of being employed reduces the probability of incidence of child labour. Specifically, where women are capable of generating income from their business, on the average child labour is likely to reduce by a margin of 8%. The intuitive behind suggests that employment status measures the level of bargaining power and enhances the mother's ability to negotiate favourably to child schooling.

The women's participation in labour market is also widely acknowledged to be the earning power and influences how much say she has in the household decision making (Doss, 2013) and this expectation is met in the study. Using a Nicaragua data of household, the literature of de Hoop et al. (2017) finds evidence of an initial fall of child labour where the women's bargaining power rises as a result of her participation in labour market. The authors discussed that mother's employment through income effect could reduce child labour. This assertion is a simple analogy because entry into labour

market is one way of increasing her bargaining power, influencing her ability to make contribution within the household, thus reducing child labour.

Although, the father may also have occupation generating income, better still, mother's behaviour becomes more sensitive and altruistic toward child's schooling affairs. This is in consonance of the predictions of Nordman and Sharma (2016) and Martinez (2013). The altruistic mother would have the incentive to focus well on child schooling in order to reduce supply of child labour. Nordman and Sharma (2016) analysis confirmed that women working to generate income may provide power, only when she is in control of her own income. The author further explained that women autonomy positively reaps greater returns on child outcomes. As such working expose women to learn new skills, situations and information, which may be translated to increase bargaining power in the home.

Furthermore, the probabilities of school attainment of the mother was examined. In reference to Table 7, specifically, women who have attained middle school education are less likely to engage their children in child labour. The magnitude of change signifies that, more years of education of mothers' is likely to reduce the prevalence rate of child labour by 4.25%. In other words, the woman's educational level has the potential of reducing the supply of child labour.

Early literatures on human capital such as Becker, Schultz and Mincer have emphasised the significance of parental education on children's human capital accumulation. Parents who possesses education appreciate the value of child's education. If the woman possesses some level of education just as the husband, it enhances her say in the household decisions (Doss, 2013). A substantial

literature has also found clear evidence of how particularly, mother's education are stronger than fathers education. Looking at Frempong and Stadelmann (2020), Majeed and Kiran (2019), Kumar and Saqib (2017) and Borga (2019) view, educational attainment levels of mothers have larger effect on the child welfare outcomes, which could also be mirrored on the education of the child. Therefore, mother's educational attainment shows a significant influence on decrease in child labour hours. This gives a signal that an educated mother probably has an affinity for child schooling and aversion to child labour.

Another factor asserted as a major determinant of child labour is household wealth level. Indeed, low level of asset and financial base have been the cornerstone of much of thinking of child labour, which children work purposely to compliment household income for living (Sasmal & Guillen, 2015). In other words, the literature indicates that child labour exists in poor household. Following Table 7, the study revealed that children from 4th and 5th quintile households, have less probability of participation in fishing and its related activities. The impact is negative and 1% level of significance in the probit and IVprobit models. It is worthy to recognise that wealth proxy index has shown an indirect consistency link in all the models. Although household wealth status has been subjected for questioning (Fors, 2012), better still, the theory stands as it corroborates with much of the literature.

Further result of the sex of the child in Table 7 indicates direct effect on supply of child labour. The result provides a detailed analysis of gender and its effect on child labour participation. It is worthy to note that female child relative to male child was significant at 1% level of significance. It is negative suggesting that within the working age, female children participate less in child

labour. In particular, it indicates that any additional participant is done by males and child labour prevalence rate increases on the average by 28.7%. The result plausibly reflects that father's attitude on child to enter labour market, increases for males than females.

Clearly, the estimate highlights the gender differentials in work and child labour participation. The presence of gender differential in child labour participation is confirmed in the work of Basu and Dimova (2020). Evidence of children working from Ethiopia indicated that girls are less likely to work than boys and the probability decreases further for young-aged girls. This also make sense in the African context where children in the adolescent age work more, which according to Ngengebuke (2016), for instance, noted that in Nigeria significant number of boys relative to girls participate more on household farms. The author further pointed out that combining farm work to school work appears easier for boys.

Finally, Emerson et al. (2014) also add that, great is the loss for children who work and is more likely to results in forgone earnings when adult. The present result is not different from child labour during the period of industrial revolution. Humphries (2012) reported that a large number of boys work, mainly in agriculture, tobacco and glass factories. Various child labour Reports such as GSS (2014 & 2019) have also affirmed estimated males participating more in child labour compared to that of girls.

Chapter Summary

The empirical chapter one of the study focused on the parental attitude, as a key driver of incidence of child labour. The estimation techniques adopted were probit and IVprobit regression models. Variables of interest were parental attitude towards child labour, mother's educational level, employment status of the mother, father's educational level, employment status of the father, household wealth index, household size, child relationship to father and gender of the child were important variables controlling the household decision making to supply child labour.

All the variables had their respective signs of effect including the insignificant variables. Hence, a compelling evidence was found that parental attitude towards child labour, mother's educational attainment, mother's employment status, father's educational attainment, household wealth index and gender of the child were significant, indicating their influence on the supply of child labour.

CHAPTER SIX

CHILD LABOUR AND EDUCATIONAL OUTCOMES

Introduction

This chapter presents the objective two of the study which focused on the effect of child labour and educational outcomes of children between 5-17 years who engage in various kinds of fishing and its related activities in Central Region of Ghana. The educational outcome is of two folds and as such, the first section examines the effect of child labour on age-adjusted school attainment. The second section focussed on child labour and cognitive skills ability. The chapter employed five models of econometric estimations: probit, bivariate probit, ordinary least squares, propensity score matching technique and IV, respectively. We first present the descriptive statistics.

Descriptive Statistics

Table 8: Distribution of Child Labour, School Attendance, Attainment and Cognitive Skills Ability

Variable	F	Percent	Mean
Child Labour Hours per week			
Average hours of work	788	100	15.70
Minimum hours of work			0
Maximum hours of work			35
Nature of Work			
Hazardous	583	73.98	
Non-hazardous	205	26.02	
Father Educational Attainment			
No formal education	28	3.53	4.598
Primary education	675	85.01	4.267
JHS/MLSC	73	9.19	4.446

Table 8: Continued

Variable	F	Percent	Mean
Mother Educational Attainment			
No formal education	10	1.27	4.714
Primary education	130	16.50	4.429
JHS/MLSC	648	82.27	3.810
Household Wealth Quintiles			
Poorest	193	24.49	
Poor	186	23.60	
Middle	197	25.00	
Rich	212	26.90	
Richest	-	-	
Household Size	788	-	5.732
Minimum household size		-	3
Maximum household size		-	10
Sex of Child			
Male	379	48.01	
Female	409	51.09	
School Attendance			
Average school attendance per year	788	-	27.32
Minimum school attendance (days) per year		-	0.00
Maximum school attendance(days) per year		-	58.00
Schooling for age (SAGE)		-	76.87
Over age in grade	720	91.4	
Official age in grade	57	7.2	
Under age in grade	11	1.4	
Cognitive Skills Development			
English Language	701	-	40.90
Mathematics		-	42.75
General Science		-	40.12
Average Score		-	41.26

Source: Akrono (2020)

The hours of work of child labour has been found to be important as it affect hours children spend in school. From the study, child labour hours measured the number of hours worked per week in the referenced period of the study. Accordingly, it is harmful when children work for quiet number of hours, likely to impede their health and schooling outcomes. In reference to Table 8,

the average hours of work per week by children between 9-17 years was 15.7, whilst the minimum and the peak working hours, ranged from 0 hours to 35 hours in all the activities per week.

Table 8 also shows the proportion of children involved in hazardous work or otherwise. Thus, in Ghana, deep sea fishing and its related activities has been termed hazardous because it is likely to hamper schooling and health. Therefore, according to the Table, children involved in hazardous work accounted for 73.98% whilst 26.02% children were engaged in non-hazardous work.

The descriptive analysis also indicates parental educational attainment. However, this has been discussed in Chapter Five. We therefore turn to the educational attainment of children who were engaged in fishing and its related activities. Sage is the schooling for age which measures current class attained relative to age. In other words, it is also used to find age distortion relative to official grade. In Ghana, the official entry age starting from Kindergarten is between four-five years and by fifteen years the child completes the junior high school.

It follows that a less score of 100, which also means child is over aged in grade attained accounted for 91.4% falling behind in education. They are falling behind in education because, some drop-out from school and return to school, repetition, or irregular in daily school enrolment. Considering a score of 100, 7.2% children have attained normal class with age. However, with a score of 100+, 1.4% children were within the above normal progress or under age and they were at least one year younger relative to the normal progress of

education system. This concludes that greater proportion of children have grade-age-distortion which suggests absenteeism or repetition.

The study also considered three core subjects: English Language, Mathematics and General Science that were done daily in school. It was found that children score 40.9%, 42.75% and 40.12% averagely in the three subjects. The overall average score of the three core subjects recorded 41.26%. This shows that academic performance of the children is below average score of 50%.

Table 9: Comparison of Intensity of Child Labour by Gender

Gender	F	Mean	Std Err	Std. Dev
Male	411	4.79	0.094	1.846
Female	377	4.13	0.055	1.129
Combined	788	4.45	0.055	1.548
Diff		-0.667	0.107	
T= -9.622	Ha: diff!=0	Pr(|T|>|t|=0.000		

Source: Akrono (2020)

Concerning the gender in relation to child labour hours, male children work for long hours as compared with female working hours. The T-test confirms a significance of mean difference between male and female child labour hours.

Table 10: Comparison of Intensity of Child Labour by Nature of Work

Gender	F	Mean	Std Err	Std. Dev
Non- Hazardous	205	4.271	0.042	1.008
Hazardous	583	4.961	0.171	2.450
Combined	788	4.451	0.055	1.548
Diff	-0.690	0.123		
T=-5.592				
Ha: diff! =0	Pr(|T|>|t|)=0.000			

Source: Akrono (2020)

Table 10 shows the bivariate analysis of the relationship between intensity of child labour by nature of work. Columns of the Table shows the mean hours spent working across nature of work. Per the results, children engaged in hazardous activities work for mean hours of 4.9 per week. Furthermore, child involved in light work has less mean hours. The descriptive analysis is intuitive since child labour hours is a variable likely to affect educational outcomes.

Child Labour and Grade -Age Adjusted School Attainment (SAGE)

To ensure consistent results of child labour on Sage, the focus variable was measured in terms of child labour participation and intensity of child labour. A probit, bivariate probit and IVprobit regression models were employed. The probit and biprobit models sought to estimate the strength and level of significance of the explanatory variables on the dependent variable: over aged in school attainment or otherwise. The IVprobit model confirmed the effect of child labour hours on cognitive skills ability (see appendix G). Results of the analysis of child labour participation on cognitive skills ability is presented in Table 11.

Table 11: Average Marginal Effect of Probit Regression: Child Labour on Grade-Age- Adjusted School Attainment (SAGE)

	Probit	Biprobit
Variable	**AME**	**AME**
Child labour participation *(no)*	0.117***	0.108***
Yes	(0.025)	(0.138)
Mother Characteristics		
Employment status *(unemployed)*		
Employed	-0.272**	-0.373**
	(0.105)	(0.180)
Educational level *(no. edu)*		
Primary Education	-0.143	-0.179
	(0.102)	(0.205)
JHS/MLSC	-0.057	-0.162
	(0.143)	(0.243)
Father Characteristics		
Employment status *(unemployed)*		
Employed	0.101**	0.082**
	(0.040)	(0.040)
Educational level *(no.educ)*		
Primary Education	-0.013	0.010
	(0.057)	(0.061)
JHS/MLSC	0.003	0.021
	(0.050)	(0.054)
Household Characteristics		
Household Wealth-*1st Quintile*		
2nd Quintile	-0.022**	-0.064
	(0.036)	(0.118)
3rd Quintile	-0.045**	-0.143
	(0.037)	(0.120)
4th Quintile	-0.115**	-0.319**
	(0.041)	(0.138)
5th Quintile	-0.111**	-0.321**
	(0.042)	(0.137)
Household size	-0.009	-0.005
	(0.009)	(0.009)
School Quality	0.177	0.0988
	(0.033)	(0.350)
Constant		0.247
		(0.664)

Table 11: Continued

	Probit	Biprobit
Variable	**AME**	**AME**
Post Estimations		
Athrho		1.884***
		(0.651)
Model specification test-_hatsq	0.077	0.122
	(0.712)	
VIF	2.22	
Wald-test(Prob>chi2)		0.0038
R-squared	0.148	
Observation	786	786

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

Source: Akrono (2020)

The probit model in Table 11 shows the average marginal effect of child labour participation followed by range of control variables on the overaged in age-adjusted school attainment. Two models were estimated: probit and biprobit regression models. There were eight predictors and four turned to be significant. The stared values represent the average marginal effect that are significant and values in parenthesis are standard errors. Therefore, we discuss only the significant variables. The details of the analysis and discussion follows. Model 1 of Table 11 shows that child labour participation is directly associated with overaged in grade age-adjusted school attainment. The analysis indicates that participation in fishing activities is statistically significant at 1% level of significance. The association is positive suggesting that increasing participation in economic activities (fishing jobs) predicts increasing overaged in age-adjusted school attainment. Specifically, on the average children who are overaged in grade attainment increases by 0.117 percent when child labour

participation in fishing activities increases. On the other hand, participation of fishing activities increases the probability of child falling behind in grade attainment.

Canelas (2015) has constantly provided reviews of this literature. Given that child labour participation leads to substantial increase in SAGE for overaged children in school attainment, Canelas (2015) in a study of child labour and child schooling in Guatemalan households found that participation in labour market significantly reduces the likelihood of completing basic school; and four times more likely to drop out from school or never enrol in school. The dropping out of school becomes prominent at the higher basic level of schooling, suggesting that drop-out rate increases with age of children. Similarly, Borga (2019) and Cuesta (2018) pointed out that child labour participation affects children's own time use on their academic work thereby hampering educational success. In addition, the authors noted that child labour participation takes out the children's commitment of attending school and influences children to work for economic gain. The result also affirms the study of Orrnert (2018) that child labour has negative impact on the educational trajectories.

In addition to child labour participation, column 2 represents the biprobit model. The result shows that child labour participation is positively signed and shows an increasing effect on overaged child in grade attainment. In other words, child labour participation significantly increases the rate of overaged children in grade attainment by 10.8%. He (2016) studied child labour in Gansu, China and pointed out that children working for more than an hour impede the progress of academic work after controlling child talents. He (2016)

emphasised that participation in child labour, even at the first hour and then further weakens as hours increase. Humphries (2012) also added that children less than 16 years were withdrawn from school and worked intensively during the pre-industrial period. In view of this, school attendance register revealed the children's irregularity.

A study of Cuesta (2018) in Ethiopia, also commented that child labour participation is likely to have significant negative effect on educational attainment. The author further pointed out that children engaged in economic activities are more likely to increase school attrition and grade repetition. Putnick and Bornstein (2015) mentioned that child labour also detract schooling hours for which it induces low progress of educational attainment in low-middle countries. The result indicates unambiguously that children who engage in child labour are more likely to have age distortion in grade of academic progress. This explains and suggests that increasing participation of child labour causes truancy at school, and so work affect human capital accumulation of children.

In addition, Table 11 presents estimates of parents' employment status and the extent of effect on over-aged school attainment. Referring from Table 11, mother's employment status was found to have a negative effect and at 5% significance level. We note that mother being employed reduces children in over-aged school attainment. This notwithstanding, father's labour market participation, particularly working in the informal sector influences the child to be over-aged in school. Perhaps, it is predicting that the child sees the father's employment status as a model that should be emulated. Thus, mother's labour market participation is viewed as a bargain power that enhances child school attainment (Nordman & Sharma, 2016; Doss, 2013). Specifically, where

women are capable of generating income from their business, child is less likely to be over-aged in school attainment. Likewise, father's employment status provides a platform for the child to acquire immediate skills necessary for future career (Basu & Dimova, 2020).

The study also controlled for household wealth proxy index likely to be a predictor of over-aged school adjusted attainment. In reference to Table 11, the wealth proxy index shows a significant factor in influencing over-aged in grade-age-adjusted school attainment of a child labourer. Akin to other studies, household wealth proxy index, a reflector of poverty level or standard of living was categorised into five categories of quintiles: poorest, poor, middle, wealthy and wealthiest quintiles, with poorest being the base category.

Albeit that some of the categories were not significant, the study finds in other quintiles a persistent negative relationship between household wealth quintiles and age-adjusted school attainment of the child labourer. A cross examination of the significant wealth shows in Table 11 that, children in labour market from household of 4^{th} and 5^{th} quintile levels remained important in the grade-age- adjusted educational attainment. The study finds that, children living in households of 4^{th} and 5^{th} quintile poverty levels have decreasing effect on over-aged grade-age-adjusted school attainment and it is 5% significance level, showing the strength and effect of possibility of evidence. It is also likely that children who are over-aged in class, on the average, reduces by 0.319 and 0.321 in column two, given per unit increase in household wealth quintiles.

In the path breaking contribution by many authors, Kumar and Saqib (2017) investigated factors that hinder school outcomes in Bangladesh. With reference to poverty level, the authors indicated that household wealth influences grade

progression, reduces school drop-out and other related educational outcomes in the child's human capital benefits. On the other hands, children who are over-aged mostly experience school drop- out and are more likely to engage in child labour. Kumar (2015), also noted that significant resource constraints in terms of poverty level maybe the hindrance to child human capital development. The discussion of the estimates give an idea that, our findings do not depart from the theoretical and empirical literature.

Post Estimation Tests

The general overview of the probit model reported in Table 11 is quite satisfactory. The post estimation results show that the independent variables have a satisfactory predictive power of pseudo R^2 = 0.148. Greene (2012) mentions that if the model fit perfectly, then it signifies a flaw in the model and considered not a good fit. The hatsq also called Hosmer-Lemeshow goodness of fit test depicts that the model fit well since insignificance result shows a good fit. In addition, the Ramsey specification test verifies the null hypothesis of no omitted variables present. Since the mean of variance inflator factor is less than 10, and as a rule of thumb, it could be concluded that there is no collinearity. In addition, the biprobit model maintains its robustness as the coefficient showing greater impact on sage.

Child Labour and Cognitive Skill Development

This sub-section of chapter six presents the estimation of the child labour on cognitive skills ability or learning outcome. The dependent variable is Cognitive Skills Ability which was measured as the average scores in Numeracy, English Language and General Science in the academic year. In all, 7 predictors: father's educational attainment, mother's educational attainment,

father's employment status, mother's employment status, household wealth index, relationship to household head and school quality were used to estimate the extent of how these variables influence cognitive skills ability in the academic year. Child labour participation and hours of work were the focus variables. Below is Table 12 representing OLS and IV regression models. Figures in parenthesis are the standard errors whilst the stared numerical values are coefficient of the p-values. Hence, the significant variables are discussed.

Table 12: Linear Regression Model: Child Labour and Cognitive Skills Ability

Explanatory Variable	**Model 1 OLS**	**Model 2 OLS**	**Model 3 IV**
Child labour participation*(no)*	-1.154**		
	(0.511)		
Child labour hours		-0.255***	-0.663**
		(0.053)	(0.269)
Mother Characteristics			
Educational attainment*(no educ)*			
Primary education	-0.804	-0.891	-1.184
	(2.312)	(2.138)	(1.678)
JHS/MLSC	-3.614	-2.530	-1.298
	(3.496)	(3.212)	(2.579)
Employment status *(unemployment)*	-5.150**	4.335	2.930
	(2.182)	(2.074)	(1.942)
Father Characteristics			
Educational attainment*(no educ)*			
Primary education	4.633***	3.840***	2.235
	(1.604)	(1.485)	(1.780)
JHS/MLSC	8.647***	7.304***	4.350*
	(2.252)	(2.113)	(2.616)
Employment status*(unemployment)*	0.450	0.641	0.833
	(0.517)	(0.491)	(0.607)
Household Characteristics			
Wealth Quintile*(1st Quintile)*			
2nd Quintile	1.597***	1.156**	0.323
	(0.573)	(0.555)	(1.001)
3rd Quintile	1.370*	1.308*	0.870
	(0.740)	(0.712)	(0.896)
4th Quintile	1.247*	1.433**	1.335
	(0.748)	(0.730)	(0.831)
5th Quintile	2.496***	2.874***	2.804***
	(0.888)	(0.865)	(0.881)
Relation to child*(biological)*			
Foster/house help	0.411	0.574	0.856
	(0.614)	(0.600)	(0.673)

Table 12: Continued

Explanatory Variable	Model 1	Model 3	Model 3
School Infrastructural Quality	1.347	1.469	2.010
	(2.301)	(2.269)	(2.466)
Constant	39.85***	42.420***	47.70***
	(5.667)	(5.761)	(6.602)
Observations	700	700	700
Post Estimations			
R-squared	0.215	0.246	0.220
VIF	1.69	1.68	
Hatsq	0.017	0.034	
	(0.410)	(0.444)	
OV test	0.273	0.000	
Endogeneity test			2.738
			(0.098)
Anderson canon corr.LM			17.014
			(0.000)

Source: Author (2020) ***p<0.01 **p<0.05 *p<0.1

Post Estimation Tests

The general overview of the OLS model reported in Table 12 is quite satisfactory. The post estimation results show that the independent variables have a satisfactory predictive power of pseudo R^2 = 0.215. Greene (2012) mentions that if the model fit perfectly, then it signifies a flaw in the model and considered not a good fit. The hatsq also called Hosmer-Lemeshow goodness of fit test depicts that the model fit well since insignificance result shows a good fit. In addition, the Ramsey specification test verify the null hypothesis of no omitted variables present. Since the mean of variance inflator factor is less than 10, and as a rule of thumb, it could be concluded that there is no collinearity. In addition, the IV model maintains its robustness as the significant variables still remain, showing impact on cognitive skills ability. The overall outlook of the models are satisfactory.

In reference to Table 12, it is apparent that child labour participation and child labour hours have negative effects on cognitive skill ability. Referring from Model 1, children engaged in fishing activities loses their intellectual ability in school. The result indicates that on the average, children who participate in child labour, their cognitive ability decreases by 1.154 and it is at 5% significance level. Regarding a robustness check in the OLS of model 2, the estimated coefficient of hours of work suggests that increase in hours of work results in low cognitive skills ability or learning outcome. It further indicates that due to increasing hours of work, the child loses its cognitive ability by 0.255. Similarly, the IV estimate also shows a negative effect of hours of work and cognitive skills ability. The IV agrees a strong coefficient of 0.663. Both the OLS and IV results show how child labour negatively affect cognitive skills ability for creating minimal capabilities in schooling.

According to the theory of minimal capabilities in human capital, Sen (1985) noted with emphasis that the loss of minimal capabilities is a hindrance to development because the child would not be able to read, calculate and process information pertinent in conducting day to day activities in social life. The study finding is also in accordance with that of ThuLe and Hosmel (2015) who examined the effect of child work on academic performance of children in Vietnam of ages between 12-14 years, and concluded that increasing participation and hours spent at work adversely impact on education variables, with the marginal impact weakening at the higher levels of work hours. Recognising the interdependency of child labour and education, Woldehanna and Gebremedhin (2015), noted in Ethiopia that an increase in the hours of work significantly result in poor PPVT of cognitive achievement.

In a similar study on child labour on cognitive development in the low-middle-income countries, Keane et al. (2018), found that participating in economic activities or time spent on economic activities is harmful for child development if it crowds out school contact hours or study time. It also corroborates with Cuesta (2018) that child labour participation lowers the average school achievement negatively and significant when viewed as exogenous variable. The empirical literature of He (2016), similarly noted in Gansu, China that, child working for at least one hour has substantial effect on academic achievement in areas of reading and mathematics after controlling talents. Cuesta (2018) practically observed that a trade-off exists between child labour and academic studies; in that hours of work negatively correlate with vocabulary and mathematics skills through reduction in human capital accumulation. Based on the analysis, the study confidently concludes that substantial increase in participation and child labour hours hamper the development of basic cognitive skills and hence, impede the future prospects in human capital accumulation.

We turn our discussion to the control variables likely to affect child cognitive ability. Following Table 12, the study revealed the effect of household wealth quintiles and its effect on child cognitive skills ability. The results show that children from the wealthiest households of the 4th quintile and 5th quintile were liable to obtain better cognitive skills ability in schooling relative to the poorest quintile. The relationship is strong at 1% and 5% level of significance in each of the models, justifying that an increase in household assets would cause an improvement in cognitive skills ability of the child. In a different

explanation, increase in household asset (5th quintile) improves cognitive skills ability by 2.496; 2.874 and 2.804 in the OLS and IV models, respectively. Our empirical estimations confirm Kumar and Saqib (2017). The authors found evidence that when households fall into poverty, child labour increases. The results also substantiate the human capital theory of Becker (1993), who analysed that wealthy households have the ability to pay for their children schooling, including earnings forgone when children spend time at school rather than work. Recall from the altruism theory that a household would only send a child to labour market only if there is subsistence requirement.

Similarly, the econometric analysis of Sasmal and Guillen (2015) further explain in the Indian context that poverty level significantly correlates with child labour and deprives children of schooling and acquisition of human skills. Indeed, increasing household wealth is likely to improve learning outcomes, because wealthy parents are able to bear the cost of education and may perceive higher value of schooling regardless of higher uncertainty in returns to education (Basu & Dimova, 2020; Frempong & Stadelmann, 2020). Hence, the prediction that wealthy households value education and then pass on to children to acquire better skills in learning outcomes is in positive direction to the literature. As rich people value education, it has the potential ability of also raising the wealth-maximising investment of their generation than that of the poor (Becker, 1993).

Again, result in Table 12 shows that parental education of the father was significant at 1% level of significance. Father's educational background increases the likelihood of the child's development in academic performance. This indicates the probability that years of parent's school attainment impact

positively on child schooling relative to parent without no education. Further analysis of model 2 and model 3 of father's educational attainment is not different. The coefficients specify that both primary and JHS/MLSC levels of education increases child's cognitive skills. This suggests that additional years of father's schooling is more likely to increase the child's intellectual ability. Our empirical results have indicated that education is a very good predictor of educational outcomes of the child.

The finding of the educational level of the father is revealing and confirms several empirical studies across the world. It supports Canelas (2015), Mukherjee and Pal (2016) and Kumar and Saqib (2017). Kumar and Saqib (2017) for example, studied school performance and child labour between the ages of 7-14 years in Bangladesh and found that educational level of parents' favours children's school outcomes. The authors further noted that, the higher the educational level of parents (mother or father), the more likelihood it lowers the absent rate of school attendance and consequently good academic performance. On the other hand, Canelas (2015) found that parental education significantly increases school outcomes and lower the incidence of child labour activities. It was also revealed from Mukherjee and Pal (2016) that parents' education is increasingly important, since low educational level, affects child's schooling outcomes. Thus, parental education is sine qua non of intergenerational transmission of child human capital formation.

Propensity Score Matching of Child Labour Participation and Cognitive Skill Ability

To address the issue of endogeneity in Model 1, that shows the effect of child labour participation on cognitive skills ability, the study sought for the

propensity score matching technique. This technique compares the cognitive skills ability of children who engage in fishing and its related activities with their counterfactual group. Before examining the results from the PSM model, diagnostic check was done to ensure the common support and balance property were satisfied. The validity test is presented in Figure 1 and Figure 2, respectively.

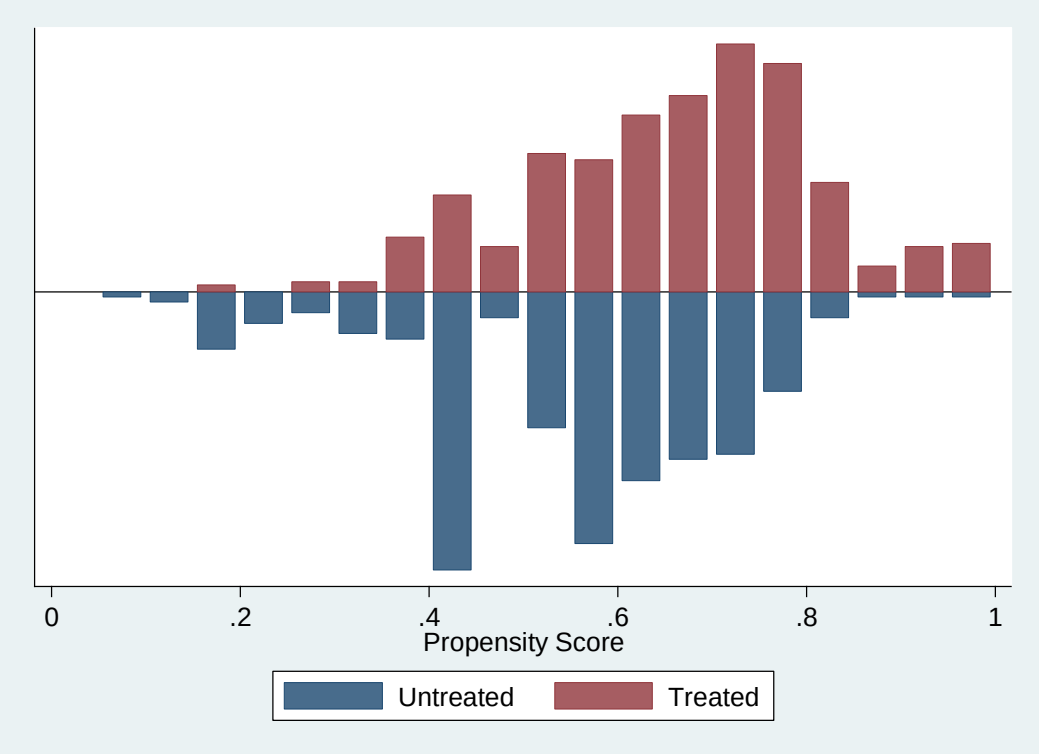


Figure 1: Histogram of Propensity Score in Treatment Group and Untreatment Group

Source: Akrono (2020)

Figure 1 shows the test for the common support assumption which illustrates the distribution of propensity scores for both treated and untreated group. Thus, the means for the covariates for the situation before and after matching were compared and whether if there were systematic differences in the distribution of covariates after conditioning on the propensity score was also checked. Following the visualization of the Figure, it confirms that after

matching, most observations in the treated group (child labour participation) were similar to that of the untreated group (no child labour participation). In other words, the model balances the coefficients.

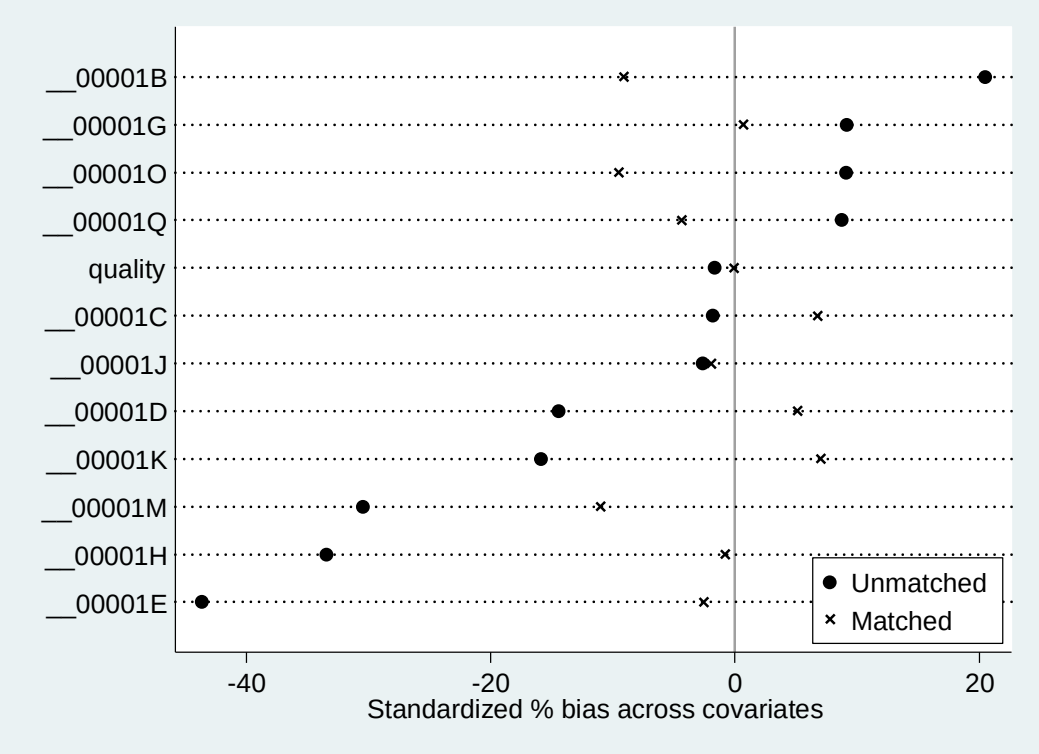


Figure 2: Scatter Plot of Covariates:Balancing Property Assumption
Source: Akrono (2020)

Figure 2 presents the balance plot of covariates which indicates the balancing property assumption. It is evident from Figure 2 that for all variables, the bias after matching is close to zero, as usually recommended. In other words, the level of reduction in bias of the various covariates after matching is satisfied. Further assessment of the balancing property is presented in Table 13.

Table 13: The Results of the Balancing Test

Sample	PsR^2	LRχ	p>chi2	Mean Bias	Med Bias	B	R	% Var
Unmatched	0.053	987.3	0.000	16.30	21.60	55.3*	0.810	100
Matched	0.000	1.490	0.983	0.6	0.5	3.5	1.030	0.0

Source: Akrono (2020) *if B>25%, R outside [0.5;2]

The results from Table 13 depicts that the bias is significantly reduced, close to 0.5% after matching. The low pseudo R and the insignificance likelihood ratio test provide further evidence that the balancing property assumption is satisfied. In addition, the Rubin's B shows the standardised difference of means of the linear index of the propensity score in the treated and control group and it is below 25%. Again, the Rubin's R which shows the ratio of treated and control variances of the propensity score ranges from 0.5 to 2.0. In all, both the Rubin's B and Rubin's R criteria lie within the acceptable range.

Table 14: Propensity Score Matching Results of Child Labour Participation and Cognitive Skills Ability

Matching Methods	ATT	SE	T value
Common Matching	-2.141	1.350	-1.59**
Kernel Matching	-1.236	0.708	-1.75**
Linear Regression	-1.322	1.350	-0.98

ATT = Average Treatment on Treated,***p<0.01 **p<0.05 *p<0.1

Source: Akrono (2020)

Table 14 presents the results of the average treatment effect of child labour participation on cognitive skills ability. In reference to the Table, the results show that the ATT obtained from the various matching algorithms were all negative and significant at 5%. This confirms the OLS estimates that child labour participation has adverse effect on the cognitive skill ability of the child.

Chapter Summary

Chapter six of empirical objective two of the study examined child labour and educational outcomes with respect to age-adjusted school attainment and cognitive skills ability. The appropriate estimation techniques adopted included; OLS, probit, IVprobit and propensity score matching models. Particular emphasis was placed on child labour participation and child labour

hours and their effect on age-adjusted school attainment and cognitive skills ability. These two variables remained significant and consistent in all the models confirming their trade-off with educational outcomes. Besides the child labour variables, household wealth index, educational attainment of the father were significant at 1% in the models and they obtained their respective directions. This chapter draws conclusion that, child labour plays a critical role in the adverse effect on educational outcomes.

CHAPTER SEVEN

CHILD LABOUR AND IMPLICATIONS TO HEALTH OUTCOMES

Introduction

This chapter presents the objective three of the study which analyses the implication of child labour on health outcomes of children between 5-17 years who engage in various kinds of fishing and its related economic activities in Central Region of Ghana. The child health outcome is of two folds and as such, the first section examines the effect of child labour on extreme fatigue. The second section focuses on the effect of child labour on child breathing problems. The chapter estimates three models of econometric estimations: bivariate probit model, probit and ordinary least squares with instrumental variable regression models, respectively.

Descriptive Statistics

Table 15 presents the descriptive statistics of children 5-17 years who engage in various fishing and its related activities by their mean hours of work per week. The summary statistics also describes age and hours per week as well as work- related injuries/illness and health risk and dangers at work. Recall that child labour participation and nature of work have already been discussed in chapter five.

Table 15: Distribution of Children 5-17 years by their activity, mean hours of work, work related risk and injury/illness

Variable	Frequency	Percentage	Mean Hours
Child labour participation			
Participation	611	77.5	
Non-participation	177	22.5	
Nature of work			
Non-Hazardous work	205	25.82	
Hazardous	583	73.43	
Child labour hours per week			
Average hours of work	788	-	15.70
Average hours of work-boys	411	-	15.64
Average hours of work-girls	377	-	14.80
Activity by mean hours per week		-	
Fishing	89	-	21.43
Marketing fish	116	-	15.83
Processing (smoking)	494	-	11.36
Hustling	31	-	10.14
Carrying/pulling heavy loads	30	-	5.07
Age and Average Hours of work		-	
9-11 years	98	-	14.33
12-15 years	508	-	15.04
16-17 years	153		16.73
Work related health injury/illness			
Child Emotional Injury	506	63.8	
Fracture	7	0.9	
Skin Problems	686	86.4	
Fever	712	89.7	
Eye Irritation	594	82.1	
Extreme Fatigue	760	96.5	
Stomach Problem	758	95.4	
Hands Stuck to Fish	647	70.9	
Breathing Problems	651	82.0	
Body Pain/Rheumatism	559	71.2	

Table 15: Continued

Variable	Frequency	Percentage	Mean
Dislocation/ Sprains	29	4.0	
Insects/Reptile Bites	673	84.8	
Burns/Scalds/Corrosions	652	82.9	
Super Facial Injury	6	0.8	
Health Risk and Dangers at Work			
Risk to fire/gas	112	14.1	
Risk to high atmospheric conditions	585	73.7	
Risk to sharp/pointed object	653	82.2	
Risk to sea waves/lagoon	646	81.4	
Risk to solvent/chemical	10	1.3	
Risk to carrying heavy loads	471	59.3	
Risk to pulling heavy loads	661	83.2	
Risk to paddling	67	7.4	
Risk to moving water/waves	650	81.9	
Risk to ventilation	51	6.4	
Noise/vibrations	114	14.4	

Percentages are only 'Yes" responses

Source: Akrono (2020)

The average hours of work per week by children with respect to age ranged from 14.33 hours to 16.73 hours, respectively. It was observed that majority of the children in the age between 16-17 years spent more hours at work. By sex, average hours of work of male children was 15.64 higher than that of females (14.80). In general, boys were noted to work longer hours than that of girls.

The various activities children engaged and the working hours spent by age group is also shown in Table 15. The activities identified were deep- sea fishing, marketing (petty trading in fresh/smoked fish), processing (fish- mongering), pulling/ carrying of heavy loads hustling for fish. Hustling involve mending net, sorting out fish, dressing of fish, running errand and fetching water from the sea

shore. As it is shown, children involved in deep-sea fishing spend 21.23 hours per week followed by marketing of fish, 15.83 hours weekly/ processing and hustling of fish also take considerable hours per week, with the least activity being the carrying/pulling of loads.

Occupational injuries and illness were also noted. Work-related health risks and hazards may provoke immediate or long-run injury or irreversible damage or permanent disability to children. Table 15 above shows various possible injuries or illness encountered by children involved in participation in fishing work during working hours. The data shows that all the children at least suffer one form of injury/illness. The commonest health effect was fatigue for which the study further revealed that nearly equal percentage of children suffer from extreme fatigue (96.5%) and stomach problems (95.4%). This was followed by fever, skin rashes, insects/reptile bites, eye irritation, burns/scalds and breathing problems during work period. Children who suffer from breathing problems were those who dive into depths to pull net or scare fish into net and as such it exposes the children to poisonous fish, needle-like fish and sharks, consequently may results in intestinal disorder or deficiency in oxygen. Stomach problems may be as a result of poor nutrition or inadequate food during working period.

In addition, eye irritation and burns are suffered by children engaged in fish-mongering. Night workers of any form of work were more likely to suffer from insect bites. Heavy work including pulling or carrying of heavy loads exerts excessive pressure on the brittle bones which may cause skeletal problems. Again, 71.2% and 70.9% of children experienced body

pains/rheumatism and hands being stuck to fish fins. All injuries and illness may cumulate into physical and mental disorders.

Also, many children in the study areas were found to engage in varied forms of fishing work for which in their quest to perform activities were faced with dangers. Although some kind of fishing work may be non-hazardous, by virtue of its nature, fishing work is categorised as hazardous for which children involved encounter a number of work-related health risk in line with the working environment.

Table 15 shows several work-related risk children face during working period. In reference to the data, many children were exposed to pulling of heavy loads (canoe/boat), sharp objects (hook/eye, knives), sea waves (swimming) with breathing problems and paddling. Nearly three-fourth of children who participate in fishing work, get exposed to cold weather conditions. Also, 59.3% face risk of carrying heavy loads (trays of fish, fishing net). Meanwhile, whilst less than 20% children are exposed to fetching water from the sea and fire/gas, noise and vibrations, others also experience poor ventilation and exposure to toxic chemicals. Children were found to work without or little supervision, which is likely to endanger the health and safety.

Effect of Child Labour on Extreme Fatigue

Table 16 reports the results of the multivariate analysis of child labour on child health outcome in terms of extreme fatigue. Child labour was measured both as dummy variable and continuous variable. In terms of estimation technique, the study first used the probit model. However, as indicated in literature, participation in fishing and its related activities is not random, but depends on both observed and unobserved factors, consequently, estimating the

effect using the probit model may produce bias results. To this end, the study further used the bivariate probit model to estimate the effect of child labour and fatigue.

Prior to the discussions, the results of the post estimation show that our model is well specified and suffers no misspecification or multicollinearity. However, the Wald test (athrho is positive and significant) and the endogeneity test from all the models indicate that child labour is endogenous. Consequently, we discuss the results of the bivariate probit and IV probit model. For ease of interpretation and discussion, we present the average marginal effects.

Table 16: Average Marginal Effects of Child Labour and Extreme Fatigue

Variable	Model 1 Probit	Model 2 biprobit	Model 3 Probit	Model 4 IVprobit
Child Labour Participation	0.213*	0.056*		
	(0.238)	(0.029)		
Child Labour Hours			0.600**	0.074**
			(0.165)	(0.036)
Mother Characteristics				
Educational level(*no edu.*)				
Primary Education	-0.498*	-0.149*	-0.480	-0.160
	(0.285)	(0.081)	(0.285)	(0.100)
JHS/Middle	-0.698	-0.145	-0.690**	-0.216**
	(0.265)	(0.095)	(0.264)	(0.095)
Father Characteristics				
Educational level(*no edu*)				
Primary Education	-0.494	-0.034	-0.518	-0.041
	(0.238)	(0.028)	(0.239)	(0.028)
JHS/Middle	-0.476	-0.145	-0.503*	-0.154*
	(0.292)	(0.092)	(0.294)	(0.093)
Household Characteristics				
Wealth Quintile(*1st Quintile*)				
2nd Quintile	0.099	0.027	0.116	0.031
	(0.152)	(.041)	(0.151)	(0.041)
3rd Quintile	-0.246	-0.058	-0.238	-0.056
	(0.162)	(0.038)	(0.161)	(0.037)
4th Quintile	0.100	0.027	0.118	0.032
	(0.154)	(0.042)	(0.154)	(0.042)
5th Quintile	-0.012	-0.026	-0.048	-0.089
	(0.036)	(0.036)	(0.148)	(0.123)
Relationship to child *(bio)*				
Foster/maidservant	0.725***	0.230***	0.715**	0.227***
	(0.166)	(0.060)	(0.166)	(0.060)

Table 16: Continued

Sex –(*male*)				
Female	0.132*	0.149*	0.160*	0.157*
	(0.107)	(.081)	(0.111)	(0.082)
Observations	774	774	774	774
Post Estimations				
Rho		0.550		0.999
Athrho		0.008		0.014
Wald test of rho chi2(1)		7.070		2.087
Prob>chi2		0.007		0.148
F-test for excluded instrument		10.38		15.72
		(0.0067)		(0.000)

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

Source: Akrono (2020)

Per the results, column 1 and column 2 show that child labour participation has positive effect on the child's health outcome of extreme fatigue. Meaning that on the average, children who participate in fishing and its related activities are more likely to suffer extreme fatigue by a margin of 5.6% and 21.3%. The p-values are significant at 10% level of significance. The results are suggestive and consistent with expectations. On explaining high incidence of child labour in Sub-Saharan Africa, Agbo (2017) comments that children participation in labour market is dis-investment in human capital formation since daily participation render the child exhausted and likely to be exposed to illness/injury causing detrimental effect on health.

The positive effect of child labour participation on health outcomes (fatigue) in the current study also substantiates Guarcello et al. (2016) study in Cambodia. The authors pointed out that additional weekly child labour participation appears to increase the likelihood of poor health outcomes by 3% point. They explained that fatigue increases based on the length of weekly participation. In Bangladesh, a similar study by Ahmed and Ray (2014) sought to explore the consequences of child labour and revealed that child labour participation positively and significantly affect good health. Ahmed et al., noted

that children get exposed to occupational hazard and increase the chances of suffering in poor health such as fatigue. From the theoretical study, household decision on child labour participation is more likely to block the full potential of children (Grossman, 2000).

As regards to child labour intensity on extreme fatigue, the study adopted a similar strategy. That is, we first estimated our model using OLS estimation technique. However, since child labour hours may not be random, but depend on both observed and unobserved factors, for that matter using the OLS estimation may produce bias or less efficient results. Consequently, to ensure consistency of the results, we further used IVprobit for the estimation. As already discussed in the methodology, the IV technique is a two- stage estimation technique that is sufficient for solving the problem of endogeneity. It is however, requires the use of an instrument; a variable that is correlated with our endogenous variable but not directly correlated with the dependent variable in the second stage regression in the structural equation. In this study, nature of work was used as the instrument for the first stage. The variable met both the relevance and validity conditions. In tandem with our suspicion and prior studies, the p-value for the test is significant thus, indicating that intensity of child labour is endogenous. Therefore, the study discusses the results in detail. Following Table 16, intensity of child labour is positive and has significant effect on extreme fatigue. Specifically, on the average, additional increases in child labour hours, increases the probability of child experiencing extreme fatigue by 0.60 in model 3 and 0.074 in model 4. Stated it differently, additional weekly hour of work adds to about 6.0 percent or 7.4 percent of the probability of child experiencing fatigue. This is alarming, especially when one takes

cognisance of the fact that the descriptive analysis shows the mean child labour hours for fishing work to be 15.70 hours per week. Specifically, children who engage in deep -sea fishing work averagely 21.43 hours per week, marketing (15.83 hours per week) and processing (11.36 hours per week).

The finding demonstrates the effect of child labour hours on adverse health outcomes of the child in terms of fatigue. Nicolella and Kassouf (2018) investigated the health effect of child labour in Brazil. Adopting fractional response model, the authors found that child labour hours is negatively associated with child health status. The study emphasized that the longer the hours worked, the worse is the child health status. Our finding suggests that fishing and its related work, particularly deep-sea fishing demands working at dawn, early morning or at night and thus, habitual loss of sleep or rest is likely to impair health. This corroborates with Ahmed and Ray (2014), that hours of work is statistically significant to the probability of child reporting tiredness or exhaustion which increases with a number of hours (threshold of 20 hours). Guarcello et al. (2016) indicated that the intensity of child labour of weekly working hours, in East Asia and Latin America affects health outcomes in terms of injuries or exhaustiveness. Sundjo et al. (2016) concluded that there is U-shaped relationship between child labour and human capital development. This according to Grossman may consequently reduce health capital resulting in increasing probability of lower productivity and wages.

Apart from the focus variables in our model, the study found that on the average, a child whose mother had attained JHS/MLSC education, decreases the likelihood of developing extreme fatigue by 0.498 percent and 0.149 percent, compared to those with no formal education. The negative effects of

mother's education on the child's health is consistent with most of the previous studies. Ahmed and Ray (2014) found negative relationship between women's education at secondary school level and its impact on child's health in the area of tiredness/exhaustion. Children's health outcomes are largely affected by their parents' level of education. Furthermore, as noted by Grossman (2000) and Jacobson (2000), well-educated mothers are less likely to have poor health outcomes of their child. It is worthy to note also that parental investment in child's capital stock formation may have the effect of making children more resourceful and willing to engage in behaviours that have longer-term consequences for better health.

Again, the results indicate that house helps and foster children on the average are more likely to suffer extreme fatigue than biological children. Specifically, a child from foster home or maidservant is more likely to be engaged in child labour and suffer fatigue. The results are significant at 1% significance level. The average marginal effect ranges between 0.031, 0.227 and 0.230 percent, respectively. Our descriptive analysis in the previous chapter, confirms this stance that foster children work more than biological children. Perhaps, parents have low altruistic behaviour of such children. Sundjo et al. (2016) have also confirmed that children of biological link with household head are less likely to be exposed to health risk. Uddin et al. (2014) concluded that over exertive work exhaust child energy stock below the minimum required to sustain physical growth and combat infection.

In reference to Table 16, the observed child specific indicator of sex shows that female children are less likely to suffer fatigue. The relationship is negative and the marginal effect expresses that a female child who is engaged in child labour

is 10 percent less likely to suffer extreme fatigue relative to the male. In other words, being a male child significantly and substantially increases the effect of suffering extreme fatigue. Recall from the previous discussions that males perform more work and that they spend more hours engaging in fishing expedition, and for that matter males are more likely to have deleterious effects on health outcome. Perhaps, the differences between gender may be attributed to an interaction of biological and environmental factors.

Our result confirms Shendell et al. (2016) that there is difficulty of regulating the working environment that are invariably informal or even illegal that further raises the health risk faced by children in general. Accordingly, Ibrahim et al. (2018) noted that physical work that is over exertive depletes a child's stock of energy required to sustain physical growth. The existence of health is possible to reinforce the child labour-human capital formation trade-off.

Effect of Child Labour on Breathing Problems

The study also examined whether child labour affects the probability of child suffering from breathing problems. Similar to the preceding objective, two dimensions of child labour were analysed (participation and intensity of child labour). In all the models, the study controlled for father's educational attainment, mother's educational attainment, household wealth index, child relationship with household head and gender of the child.

For the effect of child labour participation on breathing problems, the study employed both probit, bivariate and IVprobit models. Similar to the preceding objectives, nature of work of child labour was used as the instrument. The study also examined how the intensity of child labour affects the probability of child

suffering from breathing problems. In doing so, the study used both the probit technique and also IV technique to solve the problem of endogeneity. We present these models, how child labour participation and its intensity affect breathing problems among the children observed. In order to ensure robust results, we first discuss the post estimations.

Post Estimation Tests

To ensure valid estimations, a number of robust checks were examined. The pseudo R-squared indicates how well child labour explains adverse child health outcomes of breathing problems. The pseudo R-square shows a satisfactory value. The hatsq shows that the model fits very well since insignificant result throughout the models were higher than the $p<0.05$. The Wald test of rho also indicates that the variables discriminate well. The F-test of 10.04 suggests that the model is not weakly identified. The mean Variance Inflator Factor specifying multicollinearity checks of 2.23 suggests the tolerance of the variables and the condition index in the models were within the acceptable range (Gujarati & Porter, 2009). Hence, the suggesting the tolerance of the variables and the condition index in the models were within the acceptable range (Gujarati & Porter., 2009). Hence, the diagnostic tests all proofed satisfactory; therefore, we discuss the model in detail.

In reference to Table 17, the study finds that child labour participation only remains significant and has adverse effect on breathing problems of children observed. Specifically, children who engage in hazardous activities such as deep-sea fishing expedition are more likely to suffer from breathing problems relative to non-hazardous work. The average marginal effect is approximately 0.204 suggesting that child engaged in child labour increases the

likelihood of breathing problems by 2.04%. In other words, child labour has an increasing effect on child breathing problems.

Fishing activity, particularly deep-sea fishing has been ranked among the most hazardous activity and its ability to cause harm to children health (GSS, 2014; Agbesi, 2016). This is because the work exposes the child to waves, moving water, temperature (both cold and hot), vibrations from outboard motors, heavy and entangled loads and chemical solutions. From the work of Agbesi (2016), a study in Elmina, Central Region of Ghana, noted that fishing is a hazardous work since it exposes the children to large amount of water under the scorching sun, cold or incessant rain and other risky conditions. The author went ahead and listed a number of adverse health effect that children between 5-17 years encounter, and breathing and respiratory problems were among them. Thus, it has potential of causing severe negative consequences on the child economic life.

The empirical study of Agbenyiga (2013) on health and safety risk of children at work in Ghana, categorized sea fishing as hazardous. It was found to be hazardous because children involved get exposed to all kinds of health risk and its extreme consequence is death. The author mentioned that diving deep into the sea to disentangle net or scare fish into net exposes the child to high atmospheric pressure or accidents due to oxygen deficiency resulting in hypoxia or cardiac disorders. Further emphasis explains that breathing problems can threaten immediate damage to health.

Uddin et al. (2014), contributes to this evidence on the consequences of child market work on the growth of human capital in Sylhet city of Bangladesh. It was evidenced that child work activity significantly causes adverse effect on

health in the areas of pulmonary function, associated with the functionality of the heart and lungs, hence breathing problems. Therefore, these conditions obviously result in different health effect both in the short and long-run terms. Similar result related to breathing problems was found by Mohammed et al. (2014) on environmental and occupational health problems of child labour in Egyptian Community. The authors noted that children exposure to waves could result in devastating effect given the importance of the respiratory organs. They further explained that children are susceptible to more risk of engaging in child labour activities than adults based on rapid skeletal growth, organs and tissues development. The descriptive statistics also show 73% yes responses affirming the likelihood of affecting adverse child health outcomes in terms of breathing problems.

Table 17: Child Labour and Health Outcomes (Breathing Problems)

Variable	Model 1 probit	Model 2 biprobit	Model 3 probit	Model 4 IVprobit
Child Labour Participation	0.240*	0.6818	-	-
	(0.025)	(0.044)		
Child labour hours	-	-	0.023	0.135
			(0.046)	(.0089)
Mother Characteristics				
Educational level (*no educ*)	-0.082	-0.075	-0.091	0.077
Primary Education	(0.076)	(0.082)	(0.074)	(0.075)
	-0.088	-0.077	-0.101	-0.084
JSS/MLSC	(0.071)	(0.008)	(0.074)	(0.070)
Father Characteristics				
Educational level (*no edu*)				
Primary Education	-0.084	-0.076	-0.078	-0.075
	(0.065)	(0.066)	(0.067)	(0.062)
JHS/MLSC	-0.088	0.001	-0.101	0.021
	(0.072)	(0.083)	(0.074)	(0.076)

Table 17: Continued

Variable	Model 1	Model 2	Model 3	Model 4
Household Characteristics				
Wealth Quintile-(*1st Quintile*)				
2nd Quintile	0.063*	0.061*	0.067**	0.057*
	(0.032)	(0.032)	(0.033)	(0.037)
3rd Quintile	-	-0.068**	-0.765**	-0.068**
	0.071**	(0.032)	(0.030)	(0.037)
4th Quintile	(0.030)	-0.226**	-0.208**	-0.223**
	-	(0.042)	(0.042)	(0.037)
5th Quintile	0.219**	-0.048	-0.020	-0.423
	(0.041)	(0.148)	(0.037)	(0.282)
	-0.012			
	(0.036)			
Relationship to child(bio)				
Foster/house help	0.035	0.027	0.017	0.024
	(0.028)	(0.020)	(0.025)	(0.027)
Child Characteristics				
Sex (M*ale*)				
Female	0.020	0.200	0.023	0.026
	(0.025)	(0.025)	(0.024)	(0.025)
Observation	774	774	774	774
Post Estimations				
R-Squared	0.235	-		-
Hatsq				-
Mean VIF	2.23	-		-
Chi2 (8)				
Prob>chi2				
Wald test of Rho =0		27.85		3.97
Prob>chi2		(0.000)		(0.046)
		0.210		
F-test of excluded instrument		10.04		10.04
		(0.047)		(0.047)

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

Source: Akrono (2020)

Now we turn our attention to the control variables deemed to explain child health outcomes with respect to breathing problems. The first and second columns of Table 17 show the results for the probit and biprobit model of household wealth and child health outcome. As expected, household wealth of

second quintile was positive and significant at 10% level. This is an indication that child from wealth of 2nd quintile, is more likely to suffer from breathing problems. The child from poor household has average marginal effect of 0.061, suggesting that on the average, when a child lives in a poor household, the probability of the child suffering from breathing problems increases by 6.1 percent relative to the poorest wealth quintile. The remaining results in the column of the respective estimation techniques are stable in terms of directions and effect. Column three and four had similar results compared to column one estimations, showing further that child from poor household is more likely to have breathing problems.

It can also be noted that child labourer from middle household is a significant predictor of child suffering from breathing problems. This implies that, middle wealth is associated with decreased health problems. The child from middle household has an average marginal effect of 0.068, suggesting that on the average, when a child lives in a middle household, the probability of the child suffering from breathing problems decreases by 6.8 percent relative to the poorest quintile. The direction of effect and magnitude of change is consistent throughout the models. It shows from all the models that a child labourer in the rich household, has reducing effect on adverse health problems. In column four, we present IV estimation which also gives affirmative to the same results. In particular, the average marginal effect is similar and significant at 1% level. The average marginal effect of 0.223 signifies that on the average, child from wealthy household has less possibility of having health problems.

According to the theory of luxury axiom, poverty is more likely to lead to child labour (Basu & Van, 1998). Therefore, child early entry to labour market is

more likely to encounter more work-related health risk and consequently, adverse health problems such as the breathing problems. Accordingly, Sundjo et al. (2016) pointed out that whenever household wealth level is unstable, children are less likely to report good health as poverty may influence child labour participation and hours spent at work which greatly impact on the state of the child's health.

Health according to Grossman (2000), depreciates overtime, and enters the utility function, and positively related to wealth in the consumption model. The argument is that parents are the producers of their child's health. Based on this assertion, a child is likely to have a better health if parents themselves care about their own health and are able to spend on the sick child. Grossman emphasised that health itself is wealth and having adverse health outcomes reduces the wealth base of the household. Sick period is considered as disutility. Thus, child adverse health outcome of breathing problems becomes a disutility to the household.

Chapter Summary

Chapter seven of empirical objective three of the study examined child labour and adverse health outcomes with respect to extreme fatigue and breathing problems. Concerning, extreme fatigue and breathing problems, the appropriate estimation techniques adopted were the probit, bivariate probit and IVprobit regression models. Particular emphasis was placed on child labour participation and child labour hours and their effect on extreme fatigue and breathing problems. Based on the focus variables, child labour participation and child labour hours had an increasing effect on extreme fatigue and were found to be 5% and 1% significant. Besides, educational attainment of the mother and

child sex had decreasing effect on extreme fatigue. Child being a foster/maidservant significantly increases the possibility of child suffering from fatigue.

In the breathing problems model, child labour participation was the only focus variable that still remains a threat to child breathing problems. In addition, household wealth quintiles was significant at 1%, 5% and 10% levels. All the variables had their respective directions. This chapter draws the conclusion that, child labour participation plays a critical role in the health outcome of the child early entry to the labour market.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter gives an account of the major findings of the empirical study. It focuses on summary of the study the conclusions drawn from the findings and the policy recommendations. The summary begins with the purpose of the study, objectives, and the methodology adopted in the study. The conclusions reflect the various empirical chapters based on each objective. The recommendations and policy implications address key significant variables highlighted in the study. It also include limitations of the study and areas for future research that need attention. The details are presented below.

Summary

Generally, the study focussed attention on child labour participation and child labour hours on human capital formation in the Central Region of Ghana. The study examined the extent of parental attitude to supply child labour and how it affects child human capital formation in the Central Region of Ghana. Specifically, three objectives guided the study. The first objective sought to assess the parental attitude on child labour in terms of child labour participation and its intensity. The second objective examined the effect of child labour on educational outcomes (age-adjusted school attainment and cognitive skills ability. The third objective also determined the effect of child labour on child health outcomes in terms of extreme fatigue and breathing problems.

The theoretical framework that underpinned the study was the educational production function, human capital theory, child labour theory and intra-household decision model. In fulfilment of the objectives, quantitative method

of research from positivist paradigm and cross-sectional survey were chosen. A multi-stage with random sampling and purposive sampling techniques were adopted; and 788 household units and children between 5-17 years of age were selected which covered four study areas, namely; Gomoa West, Awutu Senya, Mfantseman and Effutu, in Central Region of Ghana. Structured interview with questionnaire was used to illicit information from the household and school head/headteacher formed the additional informant. Estimation methods used in accordance to the objectives included: probit, bivariate probit, IVprobit, propensity score matching and ordinary least squares (OLS) with IV regression models. The data analysis was done using the SPSS (Version 20) and STATA SE (Version 13) software.

The first objective sought to examine the effect of parental attitude on child labour. The following key findings emerged from objective one:

i. Father's and mother's attitudes were significantly positive and more likely of increasing incidence of child labour participation. Thus, the effect of father's attitude is greater than that of the mother.
ii. Mother's employment status had a decreasing effect and significant on child labour participation. Thus, the ability of the mother to contribute to the household decisions reduces child labour participation in fishing related activities.
iii. Both parents' educational attainment level reduces the probability of child labour participation.
iv. Children from household whose poverty level is low (3rd, 4th and 5th quintiles), had less probability of participating in fishing and its related activities.

v. On the gender perspective, being a female child significantly decreases engagement in child labour participation.

vi. The second objective examined the effect of child labour on educational outcomes. The following were the key findings that emerged:

vii. Child labour with respect to participation and working hours were negative and significantly reduces school attainment with age and cognitive skills ability.

viii. Mothers' employment status of being employed was less likely of increasing over-aged children in current grade attainment.

ix. Fathers' educational attainment at JHS level was at 1% significance level and less likelihood of increasing distortion in grade attainment with age.

x. Children from households with wealth quintiles (4^{th} and 5^{th}) status negatively and significantly reduce over-aged children in grade age adjusted school attainment as well as increases the likelihood of children cognitive skills ability.

xi. The third objective analysed the effect of child labour on adverse health outcomes (fatigue and breathing problems), considering child labour participation and intensity of work. The major findings of the third objective emerged as follows:

xii. Child labour participation and child labour hours positively and significantly have adverse effect on child health outcomes in the area of extreme fatigue.

xiii. Child labour participation significantly increases the effect on children breathing problems at 10 percent significance level.

xiv. Maternal education is 10% significance and has less probability on children adverse health on extreme fatigue, whilst children from foster home increases the likelihood of suffering extreme fatigue at 1% and 5% respectively.

xv. Being a female child labour has less possibility of suffering from extreme fatigue.

xvi. Household wealth (4^{th} and 3^{rd} quintiles) negatively and significantly at 1% and 5%, reduces children from breathing problems, whilst the 2^{nd} quintile increases children breathing problems at 10% significance level.

Conclusions

The educational production, human capital theory, child labour theory and the intra household decision framework have given insight into the human capital formation in the coastal towns of Central Region of Ghana. The child in the household was considered as both consumption and investment asset. Therefore, the decision to supply child labour implies the forgone benefit of schooling. This decision is influenced by parental attitudes and other control factors: educational attainment of parents, household wealth, household size, child age and sex, child relationship to parents, head of household experience in child labour and nature of work of child labour).

On the strength of the major findings of the study, it is worthy to draw conclusions that positive parental attitude increases the incidence of child labour with respect to participation in fishing activities and hours spent at work. This implies that parents' positive attitudes toward child labour would pave way to apprenticeship training (fishing activities), which is also viewed as human

capital formation in terms of nurturing the child for future self-employment prospects. Hence, parents view child labour not harmful and that it could be combined with schooling play a role in human capital development.

In addition, child labour (participation and intensity of work) are the drivers in increasing age-distortion in grade attainment as well as reducing cognitive skills ability. Therefore, children engaged in fishing activities in coastal areas of Central Region have lower learning ability of possessing basic skills and capabilities in terms of competencies in literacy and numeracy which may decreases their chance of gaining full potential stock of human capital needed to function in the family and the society. Thus, the presence of child labour impede both years of schooling and performance of the educational production function.

Furthermore, participation in fishing and its related activity, and intensity of work (hours of work) have consistent effect on adverse health outcomes in the areas of extreme fatigue and breathing problems. Considering the framework of health as a human capital, there is an evidence that children engaged in economic activities are prone to health risk. Hence, likely to increase health stock depreciation leading to long term consequences in the individual, family, society and the nation.

Overall, our study concludes that child labour participation and its intensity are threats and harmful to child human capital formation. As such when these children become adults, they are likely to introduce their offspring into early labour market, thereby perpetuating the cycle of child labour in the coastal towns of Central Region. Hence, child labour exists and has adverse implications to human capital development.

Recommendations

Following the summary and conclusions of the study, it is recommended that:

The Ministry of Fisheries and Aquaculture Development, Ministry of Employment and Labour Relation, Ministry of Women and Children's Affairs, Ministry of Gender, Children and Social Protection must educate women on employment avenues, in relation to fishing, that has the possibility of creating more wealth for the household. Again, the Ministry of Gender and Children's Affairs should educate the public on gender issues that would empower women to help in household decisions.

It is also recommended that Ministry of Education and Ghana Education Service should educate parents on the benefits of schooling and the cost of child labour. Again, through their Inspectorate Board, absenteeism policy must be designed to check the low commitment level of children's schooling issues in order to promote quality basic education.

The Ministry of Education in corroboration with Ghana Education Service must establish centres in every school for family counselling of parents whose child is found victim of child labour. The counselling should focus on family welfare issues reflecting on laws and policies, programmes and protective practices that set standard for addressing child labour issues in holistic manner. This would ensure the well-being of children as well as strengthening families to care for their children to promote human capital formation.

Government and social protection agencies such as Ministry of Gender and Children's Affairs should target vulnerable or poor households who engage in fishing and its related activities as part of livelihood strategies for poverty

reduction. Ministry of Local Government and Rural Development, through the municipal and district assemblies should also identify such low living standard households within their respective communities and develop strategies to support parents and children. This could be achieved through credit accessibilities (Micro Finance, Credit Unions and Rural Banks) to provide credit facilities in order to help their business grow.

Government must strictly enforce the Children's Act, 1992 Constitution, Child Right Regulation and Criminal Code Amendment Act, and made operational as regards to the restrictions regarding employment of children. Also, District Assemblies must sensitize and educate the general public the hazardous child labour activities and the likely health implications such as fatigue and breathing problems on children's welfare. The enforcement agencies such as Ghana Police Service must also be engaged to ensure an apt sanctions against parents who flout the child right laws or constitutional right of children in order to provide adequate protection for the children.

Contribution to Knowledge

Findings in this study have strengthened the existing knowledge in the following ways:

First, the study departed from the conventional model of poverty that influences child labour. Thus, the results supported the hypothesis that parents' own experience in child labour drives child's participation in economic activities (incidence of child labour) through parent's attitudes towards child labour. Therefore, differences in parental attitude is a determinant of incidence of child labour.

Secondly, unlike the previous studies that proxy "household head assessment on the child's academic ability", "enrolment rate" or "school attendance" to school performance, this study adopted Teacher-made-Test of measuring cognitive skills in English Language, Mathematics and General Science. In addition, the study treated child labour as a choice variable because it is influenced by observed and unobserved factors by adopting the Propensity Score Matching to reduce the level of biasness in the model. Again, the two different ways of measuring child labour (participation in economic activity in fishing and hours of work) have given a consistent effect on the extent at which child labour in fishing activities affect school age-attainment and the intellectual ability of the child (cognitive skills ability).

Thirdly, most often studies on child labour and health has been on the long term effect for which results are indeterminate. However, this study has brought to light the short term effect of child labour on health outcomes in terms of fatigue and breathing problems.

Limitations of the Study

First, the study could not establish the threshold of hours on which the harm to human capital formation of children begins. Second, although, the study controlled for endogeneity, due to lack of adequate data and its validity and relevance, only one instrument was used. More studies may require two or more instrumental variable in the analysis of child labour. Third, tracing some parents was a difficult task as some parents were not living with their biological parents at the time of the interview. And so guardians replaced biological parents.

Areas for Further Study

Future research study could consider long-term consequences of child labour on human capital formation of children in other towns and communities that are predominantly fish farmers. This would allow for longitudinal effect of the costs of child labour and its possible outcome on future earnings.

REFERENCES

Abou, E. P. (2014). A re-examination of the determinants of child labour. *African Economic Research Consortium (AERC) Research Paper,* 289.

Acheampong, K. (2009). Revisiting free compulsory universal basic education in Ghana. *Comparative Education, 45* (2). 175-195.

Acheampong, K., Djangmah, J., Sedu, A., Oduro, A. & Hunt, F. (2007).*Access to basic education in Ghana: The evidence and the issues.* Country Analytic Report: Sussex: CREATE.

Adu-Gyamfi, S., Donkoh, W. J. & Addo, A. A. (2016). Educational reforms in Ghana: Past and present. *Journal of Education and Human Development, 5 (3*). 158-172.

Afoakwa, C., Deng, X. & Onur, I. (2018). Women's bargaining power and children's schooling outcomes: Evidence from Ghana. *Feminist Economics, 26 (3).* 1-29. Doi: 10.1080/13545701.2019.1707847.

Afriyie, L. T., Saeed, B. I. I. & Alhassan, A. (2019). Determinants of child labour practices in Ghana. *Journal of Public Health from Theory to Practice, 27.* 211-217.

Agbenya, L. (2009). *Child labour trafficking in the Lake Volta fishery of Ghana: A case study of Ogetse in the Krachi West District of the Volta Region.* (Master's thesis, University of Thromsø, Norway.Retrieved from http://hdl.handle.net/10037/1866.

Agbenyiga, E. (2013). Child labour and well-being: The case of children in marine fishing in Ghana. *Vulnerable Children,* 139-149. Doi: 10.1007/978-1-4614-6780-9-10.

Agbesi, E. K. A. (2016). Child labour in Ghana: A case study of fishing at Elmina in the Central Region of Ghana. *Public Policy and Administration Research, 6* (12). 7-17.

Agbo, M. C. (2017). The health and educational consequences of child labour in Nigeria. *Health Science Journal, 11*(1). 1-9. Doi: 10.21767 /1791.809X.1000486.

Ahmed, S. & Ray, R. (2014). Health consequences of child labour in Bangladesh. *Demographic Research, 30* (1). 111-150.

Annim, S. K. & Darteh, E. K. M. (2007). Survival and rights: Use of children in the fishing industry on the Volta Lake in Ghana. *5th African Population Conference.* Arusha, Tanzania: 10-14 December 2007.

Antman, F. M. (2014). Spousal employment and intra-household bargaining power. *Applied Economics Letters, 8* (21). 560-563.

Ariyanti, I. (2016). Socio economic factors affecting the child labour in Palembang city Indonesia. *Journal of Internet Banking and Commerce, 21* (2), *1-36.*

Arrow, K. (1973). "Higher education as a filter". *Journal of PublicEconomics,* 193-216.

Ayifah, R. N. Y. (2018). *Essays on child labour and schooling in Ghana.* (Doctoral thesis, University of Cape Town). Retrieved from http://hdl.handle.net/11427/28435.

Badinter, E. (1981). *The myth of motherhood: An historical view of the maternal Instinct*. London: Souvenir Press.

Bahar, O. S. (2014). An overview of the risk factors that contribute tochild labour in Turkey: Implications for research, policy and practice. *International Social Work, 57* (6). 688-697.

Basu, K. (1999). Child labour: Cause, consequence and cure with remarks on international labour standards. *Journal of Economic Literature 37* (3), 1083-1119.

Basu, K. & Van, P. H. (1998). The economics of child labour. *The American Economic review, 58*(3). 412-427.

Basu, K. (2006). Gender and say: A model of household behaviour with endogenously-determined balance of power. *Economic Journal, 116(511):* 558-580.

Basu, A. K. & Dimova, R. (2020). *Household behavioural preferences and the child labour-education trade-off: Framed field experimental evidence from Ethiopia* (IZA Discussion Papers, 13011). Bonn,Germany: IZA-Institute of Labour Studies.

Basu, K. & Ray, R. (2002). *The collective model of the household and an unexpected implication for child labour: Hypothesis and an empirical test* (Policy Research Working Paper 2812). Washington DC.: World Bank.

Becker, G. S. (1964). *Human capital: A theoretical and empirical Analysis, with special reference to education.* University of Chicago Press: Chicago.

Becker, G. (Ed.). (1993). *Human capital: A theoretical and empirical analysis, with special Reference to education.* Chicago: University of Chicago Press.

Beegle, K., Rajeev, D. & Gatti, R. (2009). Why should we care about child labour? The education, labour market and health consequences of child labour. *The Journal of Human Resources. 44* (4). 871-889.Retrieved from http://www.jstor.org/stable/20648923.

Borga, L. G. (2019). Children' own time use and its effect on skill formation. *The Journal of Development Studies, 55* (5), 876-893.

Bourdillon, M. (2017). *Beyond trafficking and slavery: Ignoring the benefits of children's work. Policy Brief from International forum on working children.* La Paz: Bolivia. 16-18 October, 2017.Retrieved from http://www.opendemocracy.net.

Browning, M. (1992). Children and household behaviour. *Journal of Economic Literature, 30*, 1434-1475.

Browning, M. & Chiappori, P-A. (1998). Efficient intra-household allocations: A General characterization and empirical tests. *Econometrica, 66* (6): 1, 241-1, 278.

Canelas, C. (2015). *School, market work and household chores: A day ofGuatemalan children.* (UNU-WIDER Working Paper, 113). Helsinki: UNU-WIDER. Doi: org/10.35188/UNU-WIDER/2015/002-7

Checchi, D. (2005). *The economics of education: human capital, familybackground and inequality*. New York: Cambridge University Press.

Children's Act 560 (1998). *The Children's Act*. Accra: Government ofGhana.

Colclough, C., Lewin, K. & Chiswick, C. (1993). *Educating all the children: Strategies for primary schooling in the south*. Oxford: Clarendon Press.

Connick-Smith, N., Sandin, B. & Schrumpf, E. (1997). *Industrious children: Work and childhood in the Nordic countries, 1850-1990.*Odense, Denmark: Odense University Press.

Coombs, S. & Radburn, D. (1995). Children and young people on the land.In Winstaley M, (Eds.), *Working children in the 19th century* Preston, Lancashire: Lancashire County Books.

Cuesta, A. (2018). *Child work and academic achievement: Evidence from young lives in Ethiopia*. (DPhil in Economics for Development,University of Minnesota). Retrieved from http://www.younglives.org.uk.

Dammert, A., de Hoop, J., Mvukiyehe, E. & Rosati, F. C. (2017). *Effects of policy on child labour: Current knowledge, gaps and implications for program design.* (Policy Research Working Paper, 7999).Washington D.C.: World Bank.

Darvas, P. & Balwanz, D. (2014). *Basic education beyond the millennium development goals in Ghana: How equity in service delivery affects educational and learning outcomes.*Washington D.C: World Bank.

Das, S. (2012). Incidence of child labour and child schooling in India: Pattern and Determinants. *International scholarly Research Network, 2012*. 1-7. Doi: 10.5402/2012/429506

de Hoop, J., Friedman, J., Kandpal, E. & Rosati, F. C. (2019). Child schooling and child work in the presence of a partial education subsidy. *The Journal of Human Resources, 54* (2). 503-531. Doi: 10.3368/jhr.54.031 7.8627R1.

de Hoop, J., Premand, P., Rosati, F. & Vakis, R. (2017). *Women's economic capacity and children's human capital accumulation.* (Discussion Paper Series, No. 10501). Bonn, Germany: IZA- Institute of Labour Studies.

Doepke, M. & Zilibotti, F. (2002). *Voting with your children: A Positive Analysis of Child labour Laws* (Working Paper). Los Angeles, University of California: Department of Economics.

Donge, J. (2003). Into the black box of Ghanaian education: Why doincreased inputs not lead to better educational output? Mimeo, The Hague: ISS.

Doss, C. (2013). Intrahousehold bargaining and resource allocation in developing countries. *The World Bank Research Observer, 28* (1). 52-78. Retrieved from http://wbro.oxfordjournals.org/

Emerson, P. M., Ponczek, V. & Souza, A. P. (2014). Child labour and learning. Economic. *Development and cultural change, 65(2).* 265-296.

Edoh-Torgah, N. A. (2018). Metaphor of child labour: Is it always Negative? A narrative Analysis. *Journal of Educational, Health and Community Psychology, 7 (2).* 247-264.Doi: 10.1093/acprof:oso/9780199558582.001.0001

Fasih, T. (2008). *Linking education policy to labour market outcomes.* Washington D. C: The International Bank for Reconstruction and Development/The World Bank.

Fershtman, C., Murphy, K. & Weiss, Y. (1996). Social status, educationAnd growth. *Journal of Political Economy, 104*(1). 108-132.

Fors, H. C. (2012). Child labour: A review of recent theory and evidence with policy and implications. *Journal of Economic Series, 26* (4). 570-593.

Frempong, R. B. & Stadelmann, D. (2020). Risk preference and childlabour: Econometric Evidence. *Review of Development Economics, 25* (2), 878-894.

Gay, L. R. & Airasian, P. (2000). *Educational research: competencies for analysis and application.* Upper Saddle River, NJ: Prentice-Hall. Ghana Statistical Service (2008). *Ghana living standards survey round 5*, Accra, Ghana: Ghana Statistical Service.

Ghana Statistical Service (2013). *2010 population and housing census report: Central Region*. Accra, Ghana: Ghana Statistical Service.

Ghana Statistical Service (2014). *Ghana living standards survey round 6, 2013. Child labour report.* Accra, Ghana: Ghana Statistical Service.

Ghana Statistical Service (2014a). *2010 population and housing census: District Analytical Report. Effutu Municipality*. Accra, Ghana:Ghana Statistical Service.

Ghana Statistical Service (2014b). *2010 population and housing census: District Analytical Report. Awutu Senya District*. Accra, Ghana:Ghana Statistical Service.

Ghana Statistical Service (2014c). *2010 population and housing census: District Analytical Report. Gomoa West District*. Accra, Ghana:Ghana Statistical Service.

Ghana Statistical Service (2014d). *2010 population and housing census: District Analytical Report. Mfantseman District*. Accra, Ghana: Ghana Statistical Service.

Ghana Statistical Service (2018). *Education statistics: Tracking progress In Ghana's basic level education across the districts 2010-2016.* Accra, Ghana: Ghana Statistical Service.

Ghana Statistical Service (2019). *Ghana Living standard Survey round 7. Main report*. Accra, Ghana: Ghana Statistical Service.

Glewwe, P. (2002). Schools and skills in developing countries: Education Policies and socioeconomic outcomes. *Journal of EconomicLiterature. XL*, 436-48.

GoG,, UNICEF., ILO. & ICI. (2017). *National Plan of Action: Phase II (NPA 2) for the Elimination of the Worst Forms of Child Labour in Ghana (2017-2021) Towards Achieving Sustainable DevelopmentGoal (SDG) 8.7*. Accra, Ghana: GoG, UNICEF, ILO, ICI.

Goldin, C. & Parson, D. O. (1989). Parental altruism and self-interest: Child labour Among American families. *Economic Inquiry, 27*(4) 637-659.

Goldin, C. & Sokoloff, K. (1982). Women, children and industrialisation in the early Republic: Evidence from the manufacturing censuses. *Journal of Economic History*, 42(4); 741-774.

Government of Ghana (2015). *The composite budget of the Awutu Senya District for the 2015 fiscal year.* Accra, Ghana: Ministry of Finance.

Government of Ghana (2018). *The 2019 budget statement and economic policy.* Accra: Ministry of Finance.

Graham, C. K. (1976). *History of education in Ghana*. Accra: Ghana Publishing Corporation.

Greene, W. H. (Ed.). (2012). *Econometric analysis*. Prentice Hall: Pearson Education, Inc.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political Economy. 80*(2), 223-255.

Grossman, M. (2000). The human capital model. In A. Culyer & J. Newhouse (Eds.), *Handbook of heath economics. 1A*, (347-408)Amsterdam, The Netherlands: Elsevier Science.

Guarcello, L., Lyon, S. & Valdivia, C. (2016). *Adolescents in hazardous work: Child Labour among Children aged 15-17 years.* Understanding Children's Work, Geneva:ILO.

Gujarati, D. N. & Porter, D. C. (5ed) (2009). *Basic econometrics*. NewYork: McGraw Hill Inc.

Guryan, J., Hurst, E. & Kearney, M. (2008). Parental education and parental time with children. *Journal of Economic Perspectives, 22* (3). 23-46.

Hamenoo, E. S., Dwomoh, E. A. & Dako-Gyeke, M. (2018). Child labourin Ghana: Implications for children's education and health. *Children and Youth Services Review*, 93. 248-254.

Hanushek, E. A. (1995). Interpreting recent research on schooling in Developing Countries. *World Bank Research Observer,* 10 (2). 227-117.

Hanushek, E. A. & Wößmann, L. (2010). Education and Economic growth. In P. Peterson, E. Baker, & B. McGraw (Eds.*), International encyclopedia of education, 2*. (245-252). Oxford: Elsevier.

He, H. (2016). Child labour and academic achievement: Evidence from Gansu Province in China. *China Economic Review, 38*, 130-150.

Holgado, D., Maya-Jaiego, I., Ramos, I., Palacio, J., Oviedo-Trespalacios, O., Romero-Mendoza, V. Amar, J. (2014). Impact of child labour on academic performance: Evidence from the Program Educame Primero

Columbia. *International Journal of Educational Development, 34,* 58-66.

Horrel, S. & Humphries, J. (1995). "The exploitation of little children: children's work and the family economy in the British industrial revolution". *Exploitation in Economic History, 38* (3). 339-365.

Horrel, S. & Humphries, J. (2018). Children's work and wages, 1270-1860. *Discussion Papers in Economic and Social History, 163*. Oxford.

Huber, M., Lechner, M. & Wunsch, C. (2013). The performance of Estimators based on the propensity score. *Journal of Econometrics,175* (1), 1-21.

Humphries, J. (1981). Protective legislation, the capitalist state and working class men: The case of the 1842 mines regulation act. *Feminist Review. 7*(1), 31-65

Humphries, J. (2003). Child labour: Lessons from the historical experience of today's industrial economics. *The World Bank Review. 17* (2). 175-196.

Humphries, J. (2012). Childhood and child labour in the British industrial revolution. *Economic History Review, 66*(2). 395-418.

Ibrahim, A., Abdalla, S.M., Jafer, M., Abdelgadir, J. & de Vries, N. (2018). Child labour and health: A systematic literature review of the impacts of child labour on child's health in low-and-middle-income countries. *Journal of Public Health. 14*(1). 18-26. Doi: 10.1093/pubmed/fidy018.

Idler, E. L. & Benyamini, Y. (1997). Self-rated health and mortality: A Review of twenty-seven community studies. *Journal of Health and Social Behaviour, 38* (1): 21-37.

ILO (2007). Essential questions on child labour for household surveys. IPEC. Geneva: ILO.

ILO (2013). *Making progress against child labour: Global estimates and trends, 2000-2012.* IPEC. Geneva: ILO.

ILO (2013a). *Analytical study of child labour in Volta Lake fishing in Ghana.* IPEC. Geneva: ILO.

ILO (2016). *Child labour in the fish supply chain on the Lake Volta, Ghana:The Torkor Model.* IPEC. Geneva: ILO

ILO (2017). *Global estimates of child labour: Results and trends, 2012-2016.* Geneva: ILO

ILO (2018). *Towards the urgent elimination of hazardous child labour.* Geneva: ILO.

Isreal, G. D. (1992). *Determining sample size. Programme evaluation and organisational development IFAS extension.* Gainesville, US: University of Florida.

Jacobson, L. (2000). The family as producer of health: An Extended Grossman Model. *Journal of Health Economics. 19,* 611-637.

Keane, M., Krutikova, S. & Neal, T. (2018). *The impact of child work on Cognitive Development: Results from four low to middle income countries.* (IFS working Paper W18/29). Oxford: Economics andSocial Research Council.

Khanam, R. & Ross, R. (2011). Is child work a deterrent to school attendance and school attainment?: Evidence from Bangladesh. *International Journal of Social Economics, 38* (8), 692-713. http://dx.doi.org/10.1108/030682 91111143901.

Kumar, A. (2015). One more year of schooling or work: Grade Transition and Child labour In Rural Bangladesh. *The Journal of Developing Areas. 49 (3).* 27-48.

Kumar, A. & Saqib, N. (2017). School absenteeism and child labour in rural Bangladesh. *The Journal of Developing Areas.* 51 (3). 299-316.

Kuyini, A. B. (2013). Ghana's education reform 2007: A realistic proposition or a crisis of vision? *International Review of Education,59,* 157-176.Doi 10.1007/s 11159-013-9343-7. www.jstor.org/stable/42636140.

Lall, S. (1987). *Learning to industrialise: The Acquisition of technological capability in India.* London: Macmillan.

Lazear, E. (1977). Education: Consumption or Production? *Journal of Political Economy, 85* (3). 569-598.

Lester, T. (1975). *Generating inequality.* New York: Basic Books.

Lima, L., Mesquita, S. & Wanamaker, M. (2015). Child labour and the Wealth paradox: The role of altruistic parents. *Economic Letters,130,* 80-82.

Lindbeck, A., Nyberg, S. & Weibull, J. (1999). Social norms and economicsincentives in the welfare state. *Quarterly Journal of Economics,114* (1), 1-35.

Little, A. W. (2010). *Access to basic education in Ghana: Politics, policies and progress.* CREATE Country Analytic Report, Sussex: CREATE.

Lundberg, S. & Pollak, R. A. (1993). Separate bargaining and the marriage Market. *Journal of Political Economy, 101* (6), 988-1010.Retrieved from https://www.jstor.org/stable/2138569.

Machamer, P. (2002). A belief historical introduction to the philosophy of science, In P. Machamer, & M. Silberstein (Eds.). *The Blackwell Guide to the Philosophy of Science* (1-17). Oxford: Blackwell.

Majeed, M. T. & Kiran, F. (2019). Women's decision making power and Child labour: Evidence from Pakistan. *Quality and Quantity, 53,* 2175-2197.Retrieved from http://doi:10.1007/S11135-019-00864-Y

Martinez, C. A. (2013). Intrahousehold allocation and bargaining power: evidence from Chile. *Economic Development and Cultural Change, 61* (3). 577-605.

Mincer, J. (1974). *Schooling, experience and earnings.* New York: Columbia University Press.

MoE (2013). *Education sector performance report.* Accra: Ministry of Education.

Mohammed, E. S., Mahfouz, E. & Ewis, A. A. (2014). Child labour in a rural Egyptian Community: An epidemiological study. *International Journal of Public Health, 59,* 637-644. Retrieved from http://doi: 10.1007/s00038-014-0559-5.

Morrow, V. & Boyden, J. (2018). *Responding to children's work: Evidence from the Young Lives Study in Ethiopia, India, Peru and Vietnam, Summative Report.* Oxford: Young Lives.

Mukherjee, C. & Pal, R. (2016). *Role of parental expectations in determining child labour and schooling.* Sweden: Lund University.

Nardinelli, C. (1990). *Child labour and the industrial revolution.* Bloomington: University of Indiana Press.

Ngenzebuke, R. L. (2016). *Female say on income and child outcomes: Evidence from Nigeria.* (WIDER Working Paper 2016/134).Helsinki: UNU-WIDER.

Nicolella, A. C. & Kassouf, A. L. (2018). The effect of child labour on children's health in Brazil. *International Journal of Social Economics, 45* (2). 357-371.

Nitko, A. J. (Ed.). (2001). *Educational assessments of students*. New Jersey: Prentice Hall inc.

Nishijima, M., de Souza, A. P. & Sarti, F. M. (2015). Trends in child labour and the impact on health in adulthood in Brazil from 1998-2008. *Cadernos de Saude Publica, 31*(5), 1071-1083.

Nordman, C. J. & Sharma, S. (2016). *The power to choose: Gender balance of power and Intra-household educational spending in India.* UNU-WIDER Working paper. Retrieved from http://wider.unu.edu.

OECD (2013). *Education at a glance: OECD Indicators*. OECD Publishing. Retrieved from http://dx.doi.org/10.1787/eag-2013-en

O'Donnell, O., Rosati, F. C. & van Doorslaer, E. (2005). Health effects of child work: Evidence from Rural Vietnam. *Journal of Population Economics, 18* (3). 437-467.

Orrnert, A. (2018). *Link between child labour and education.* K4D Help Report: Brighton, UK: Institute of Development Studies.

Osterman, P. (1980). *Getting started: The youth labour market*. Cambridge, MA: MIT Press.

Patacchini, E. & Zenou, Y. (2011). *Neighbourhood effects and parental involvement in the intergenerational transmission of education Journal of Regional Science, 51* (5), 987-1013.

Patrinos, H. A. & Shafiq, N. (2010). An empirical illustration of positive stigma towards child labour. *Economics Bulletin, 30* (1). 43-63.

Posso, A. (2018). The health consequences of hazardous and non-hazardous child labour. *Review of Development Economics, 23* (2). 619-639. Retrieved from https://doi.org/10.1111/rode.12571.

Poulson, B. W. (1994). *Economic development: Private and Public Choice.*New York, USA: West Publishing Company.

Psacharopoulos, G. (1994). *The profitability of investment in education: concepts and methods.* Washington, DC. : World Bank.

Psacharopoulos, G. (2006). The value of investment in education: Theory, evidence and Policy. *Journal of Educational Finance, 32* (2) 113-136.

Psacharopoulos, G & Woodhall, M. (1997). *Education for development: An analysis of Investment choice*. New York: Oxford University Press.

Psacharopoulos, G. & Yang, H. (1991). Educational attainment among Venezuelan youth: An Analysis of its determinants. *International Journal of Educational Development 11*(4), 289-294.

Putnick, D. L. & Bornstein, M. H. (2015). Is child labour a barrier to school enrolment in Low and Middle income countries? *International Journal of Education Development, 41*, 112-12-.

Quatrri, M. & Watkins, K. (2016). *Child labour and education: A Survey of Slum Settlements in Dhaka, Bangladesh.* London: Overseas Development Institute.

Rubin, D. (2004). Teaching statistical inference for causal effects inexperiments and observational studies. *Journal of Educational and Behavioural Statistics, 29*, 343-367.

Rutstein, S. O. & Johnson, K. (2004). The DHS wealth index. *DHS Comparative Reports.* No. 6. Calverton: ORC Macro. Retrieved from https://dhsprogram.com/pubs/pdf/CR6/CR6.pdf

Sahu, K. K. (2013). An empirical study of determinants of child labour. *International Journal of Science Environment and Technology,2* (3), 423-433.

Samuelson, P. A. (1956). Social indifference curves. *Quarterly Journal of Economics, 70* (1). 1-22.

Sarantakos, S. (2013). *Social research.* London: Palgrave Macmillan.

Sasmal, J. & Guillen, J. (2015). Poverty, educational failure and the child-labour trap: The Indian experience. *Global Business Review, 16* (2). 270-280.

Satz, D. (2003). Child labour: A normative perspective. *The World Bank Economic Review, 17*(2). 297-308.

Sen, A. (1985). Well-being, agency and freedom. The Dewey lectures 1984. *The Journal of Philosophy, 82*(4), 169-221.

Sen, A. (1992). *Inequality re-examined.* Oxford University Press.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51* (1). 1-17.

Schultz, T. W. (1963). *The economic value of education.* New York:Columbia University Press.

Shendell, D. G., Noomnual, S., Chishti, S., Allacci, M. S. & Madrigano, J. (2016). Exposures resulting in safety for child labourers in less Developed countries. *Journal of Environmental and Public Health, 6,* 1-10. DOI: 10.1155/2016/3985498.

Soares, R. R., Kruger, D. & Berthelon, M. (2012). Household choices of child labour and schooling: A Simple Model with Application to Brazil. *The Journal of Human Resources, 47* (1). 1-31. Retrieved from https://www.jstor.org/stable/23214380.

Spence, M. (1973). Job market signalling. *Quartely Journal of Economics*, 355-374.

Stiglitz, J. (1975). The theory of 'screening', Education, and the distribution of income. *American Economic Review*, 65:283-300.

Sundjo, F., Baye, F. M., Egbe, J. E. & Mbu, D. T. (2016). Contemporaneoushealth consequences of child labour in Cameroon. *International Academic Journal of Economics and Finance, 2* (2). 48-75.

Tabachnick, B. G. & Fidell, L. S. (1996). *Using multivariate statistics.* New York: Harper Collins College Publishers.

Tafere, Y. & Pankhurst, A. (2015). *Can children in Ethiopia communities combine schooling with work?* Working Paper 141. Oxford: Young Lives.

Thevenon, O. & Edmonds, E. (2019). *Child labour: Causes, Consequences and Policies to tackle it.* OECD Social, Employment and Migration Working Papers. No. 235. Retrieved from http://dx.doi.org/10.1787/f6883e26-en

Thompson, N. M. & Casely-Hayford. L. (2008). *The financing and outcomes of education in Ghana.* RECOUP Working Paper. No. 6. Oxford: RECOUP.

ThuLe, H. & Hosmel, R. (2015). The impact of child labour on children's education performance: Evidence from rural Vietnam. *Journal of Asian Economics, 36*,1-13.Retrieved from http://doi: 10.1016/j.asieco.2011.11-001.

Todaro, M. P. & Smith, S.C. (2006)(8th ed.). *Economic development.* Addision-Wesley, Reading.

Tuesta, D. A., Sorensen G., Camara, N. & Haring, A. (2015). *Financial inclusion and its determinants: The Argentina case.* (BBVA Research Working Paper No. 15/03). Madrid: BBVA.

Uddin, M. N., Hamiduzzama,M. & Morad, M. (2014). Hazardous child labour and psycho-Physical and economic consequences: A Study in Sylhet City: Bangladesh. *Innovative Issues and Approaches in Social Sciences, 7 (1).* 6-18.

UCW (2016). *Child labour and the youth decent work deficit in Ghana.* Inter-Agency Country Report: Understanding Children's Work Programme.

Weiner, M. (1991). *The child and the state in India.* Princeton, N. J: Princeton University Press.

Woldehanna, T. & Gebremedhin, A. (2015). *Is child work detrimental to the educational achievement of children? Results from Young Lives in Ethiopia.* Working Paper 140. Oxford: Young Lives

Wolf, S., McCoy, D. C. & Godfrey, E. B. (2016). Barriers to school attendance and gender inequality: Empirical evidence from a sample of Ghanaian school children. *Comparative and International Education, 11 (2),* 178-193.

World Bank (2004). *Books, buildings and learning outcomes: An impact Evaluation of World Bank support to basic education in Ghana.*Washington, DC: World Bank.

World Bank (2013). *World Development Indicators*. Washington DC.:World Bank.

Yin, R. K. (2009). *Case study research design and methods.* Applied Social Research Methods Series, 5. London: Sage publications.

Zelizer, V. A. (1985). *Pricing the priceless child: The changing social value of children.* New York: Basic Books.

APPENDICES

A: QUESTIONNAIRE

Dear Parents,

This is an academic research being undertaken by Benedicta Leonora Akrono of the School of Economics, University of Cape Coast. She is undertaking an academic research of the above- mentioned topic and your household has been purposively selected. You are kindly requested to respond to the questions as objectively as possible. All information provided by you will be treated as confidential. Thank you.

2018

STUDY AREA **STUDY AREA CODE**

HOUSEHOLD ID PER STUDY AREA

FIELD ASSISTANT CODE

DATE OF INTERVIEW……

START TIME…… **END TIME……**

CONTACT NO. ……..

SURVEY INFORMATION

STUDY AREA

DISTRICT……. .1

MUNICIPAL……...2

Awutu Senya West….. A1

Gomoa West……G1

Effutu……..…..…E2

Mfantseman……..M2

HOUSEHOLD ID PER STUDY AREA

Awutu Senya West…….A11, A12, etc

Effutu……..….E21, E22, etc

Gomoa West……..G11, G12, etc

Mfantseman……..…M21, M22, etc

FIELD ASSISTANT CODE

Awutu Senya West…….FA1

Effutu……..…….FE3

Gomoa West……..…FG3

Mfantseman……..FM3

PARENTS' DEMOGRAPHIC DATA

INSTRUCTION: SECTION "A" AND "B" ARE TO BE RESPONDEND BY THE HOUSEHOLD (MOTHER AND FATHER)

SECTION A

BACKGROUND INFORMATION (DEMOGRAPHIC CHARACTERISTICS)

1. Demographic information about the household head:

A) Marital status [MARITALS]	**D) Age [HAGE]**	**E) Religion [RELIG]**
Single…….[1] Married, living together…...[2] Married, separated…..[3] Married, not living together……[4]		Christian…….[1] Muslim……...[2] Traditional…..[3] Other……...[4]
F) Head of household[HHLD]		**G) Number of children [CHN]**
Father [1] Mother [2]		Bio/relative [ ] Foster/Househelp [ ]

SECTION B

HOUSEHOLD ECONOMIC CHARACTERISTICS

2. Kindly, provide the following responses:

A) Highest educational level attained [HEDU]		**B) Occupational Status [OCCUST]**	**C) Specific Occupation [SOCCU]**	
No schooling….0 Primary…….1 Middle/JSS/JHS ….....2 SHS/tech/Voc ……3 tertiary…….4 Other, specify…		Working ……1 No work……2	No work……...0 Fish farming….1 Boat carver…...2 Paddle carver…3 Fish seller...…..4 Sale of fishing equipment…….5 Fish monger…..6 Crop farming…7 Petty trade……8 Public/civil servant…….9 Other …….10	
F		**F**	**F**	
M		**M**	**M**	

3. Kindly state Yes [1] or No [0] to the following household items owned. **[WEALTH]**

ASSETS [WEALTH]	**Yes [1] No [0]**
ELECTRONICS	
Furniture	
TV	
DVD/VCD player	
Radio	
iPad/Tablet	

Laptop/Desktop computer	
Phone	
Satellite dish	
Fan	
Air conditioner	
Cooking stove	
Blender	
Pressing iron	
Kettle	
STORAGE DEVICE	
Fridge /deep freezer	
Cold store facility	
VEHICLES	
Car	
Motorcycle	
Bicycle	
EQUIPMENT/FACILITIES	
Outboard motor	
Fish pond	
Fishing net/mesh	
Twine/hook & eye	
Rented house	
Owner occupier house	
Owned canoe/boat	
Paddle	
Fish oven (mud)	
Fish oven (gas)	
ORNAMENTS	
Jewellery	
MATERIALS MADE OF	
House made of cement	
Roof made of aluminum/slate	

Floor made of cement	
Floor made of terrazzo	
Floor made of tiles	
WATER/SANITATION	
Portable water (private)	
Portable water (public)	
Bore hole water	
KVIP	
WC toilet	
OTHER ASSETS	
Savings accounts	
Land	
Other, specify…….	

4. Estimate approximately how much you have spent in the household over the past one month in GH¢. **[HEXP]**

Items frequently bought	**F GH¢**	**M GH¢**	**Items frequently bought**	**F GH¢**	**M GH¢**
Transportation			Accessing public toilet facility		
Toiletries			Rent payment/owner occupy rent		
Food in the household			Gas/firewood/kerosene for cooking		
School stationaries, eg. Pen			Petrol/diesel		
Transfer payment to relative			Hair fix/hair cut		

Airtime			Sanitary		
Water bill/ buy water					
Electricity bill/pre-paid					
Savings					
Repair/maintenance					
Miscellaneous					

5. In this community, when you engage in any kind of child labour activity, what is the mode of payment **[CHILDCONT]** (whether in-cash [1] or in-kind [0]).

6. Estimate on average, how much is spent on the child per term per academic year? Do not include bursary/scholarship

Item	**Estimated cost [FEDUEXP]**	**Estimated cost [MEDUEXP]**
School uniform **[UNIFORM]**		
Exams fees **[XFEES]**		
School bag **[SCHBAG]**		
Sandals/shoes **[FOOTWEAR]**		
Books eg, notebooks, textbooks **[STATIONARY]**		
Feeding **[FEED]**		
Transportation **[T&T]**		
School extra classes **[EXCLASS]**		
Excursion **[TOUR]**		
PTA dues **[PTA]**		
In kind ie. Gift to teacher **[INKIND]**		

7. Who pays for most of child expenses **[CHDEXP]**

Father [1] mother [2] both [3] other, specify…….

8. What else do you do for your child's education? Tick as appropriate

Parental involvement [PINV]	**YES=1, NO = 0**	
	F	**M**
Parental motivation, eg, gift to child for academic progress		
Capacity to help child with academic work at home		
Periodic visit to school to check progress of academic work		
Pay extra tuition fees at home		
Provision of educational materials promptly, eg textbooks		
Attending PTA		
Designated study area for child, eg, desk, book self, etc		
Attending PTA meetings		
Attending open days		

9. Do you intend to further child education at where he/she has reached currently**. [FUREDU]**

Key [1]= in favour [0]= not in favour

Father [ ] Mother [ ] Both parents [ ]

10. What level of education do you want your child to reach? **[CHDEDU].**

Primary, Basic level [1]; JHS, Basic level [2]; SHS/Tech/Voc [3], Tertiary, Diploma level [4]; Tertiary, Degree level [5].

Based on Q.16, give a remark on risk attitude **[RISKATT]**

Remarks: low investment [1] average investment [2] high investment [3]

11. To what extent do you expect future job prospect from the child, even-though he/she engages in child labour?

Future Expectation	**1**	**2**	**3**	**4**
desire for child to manage fishing business				
parents' supervise child labour activities and so it is not harmful				
having no desire to further child's education				
parents' view child labour as a voc./tech. training for future job prospects				

Key:1= v. strongly (1.0) 2= strongly (0.75) 3= fairly (0.5) 4= slightly (0.25)

12. Are you relying on your child for support in old age? **[OLDAGE]**.

Yes[1] No [0]

13. Suppose your expenditure in child's education cost an amount, quote a value ¢…… and the number of years of education you would like your child to attain….. at 25% per annum **[DISCOUNT] F[ ]… M[ ]**……

14. On the average, how much do you expect your child to remit you, monthly. **F[ ] M [ ]**

SECTION C

INSTRUCTION: THIS SECTION WOULD BE RESPONDEND BY THE CHILD WHO IS INVOLVED IN CHILD LABOUR ACTIVITIES.

CHILD CHARACTERISTICS

GRADE KEY:

KG [1]; KG 2[2]; P1-----[3]; P2------[4]; P3-----[5]; P4------[6]; P5------[7]; P6------[8]; JHS------[9]; JHS2-----[10]; JHS3-----[11]

15. Sex **[SEX]** Male [1] female [0]

16. Your birth order **[BORDER]** ……

17. State current grade **[CGRADE]**……..

18. State entry age of the child **[ENTRYAGE]** …….

19. State actual age of the child (age by September) **[AGE]**……..

20. Have you been repeated before in school? **[REPEAT]** Yes [1]; No [0] go to Q33.

21. Why were you repeated?.....

CHILD ECONOMIC ACTIVITIES

22. List working activities child did over the week (Monday-Friday). **[SCHDAYS]**

Age of Child [AGE]	**Kind of work[ACTIVITY]**	**Number of times [PERFORM] per week**	**Hours per day [WKHOURS]**
Hours per week [WKHOURS]	**Supervised Yes[1] No[0]**	**Nature of Work H[1] NH [0]**	**Child Labour Yes [1] No[0]**

23. Do you receive wage? Cash [ ] In-kind [ ]

24. Why do you engage in fishing activities? **[REASONWK]**

[1]=Supplement household income. [2]=Help family business [3]=Help pay debt [4]=Cater for school expenditure [5]=Not interested in schooling [6]=Schooling is stressful. [7]=Academically weak. [8]=Other, specify……

25. State the level of your desire for schooling. Very undesirous [1]; undesirous [2]; neutral [3]; desirous [4]; very desirous [5]

26. Kindly respond Yes/No to the following responses. Multiple response may be applied.

Child desire for schooling [DESIRE]	**[1]=Yes; [0]NO**
26a. Attending school on time**[ATTENDACE]**	
26b. Doing homework **[HOMEWK]**	
26c. Capacity to learn at home **[LEARN]**	
26d. Participate in class **[ACTIVENESS]**	
26e. Desire to complete all levels of basic school and beyond **[SCHATTAIN]**	
26f. Other, specify……**[OTHER]**	

27. Are you exposed to any of the following health threats at work and to what extent are you concerned about the situation?

A. Health Risk and hazards [HRISK]	**[1]=Yes; [0]=No**
Physical Risk	
Exposed to dust/fumes/waves	
Exposed to fire, gas or flames	
Exposed to extreme cold or heat	
Dangerous tools at work, eg knives	

Work underwater (eg, lake, sea, river	
Exposed to or use of chemicals, eg DDT	
Carriage of heavy loads, eg lifting outboard motor, fishing net	
Pushing and Pulling heavy object, eg boat, canoe, fishing net	
Paddling	
Fetching water from the sea	
Insufficient ventilation at work	
Loud noise or vibrations	
Other, specify…….	

28. State the kind of injury and how it has affected your schooling.

Kind of injury[INJURY]	**Yes [ ] No [ ]**
Do you experience emotional or mental injury	
Do you get fracture	
Do you get skin problems/sores	
Do you get fever	
Do you experience extreme fatigue	
Do you have stomach problems/diarrhea	
Do you get eye problems	
Do you experience breathing problems as a result of smoke inhalation	
Are you stuck by fins of big fish /stung fingers	
Do you get burns, scalds, corrosions or frostbite	
Are you affected by body pain and rheumatism	
Do you get dislocations, sprains	
Does insect bites at work	
Do you get super-facial injuries	
Do you get reptile bite, eg snake	

SECTION D

INSTRUCTION: SECTION "D" WOULD BE ANSWERED BY HEAD TEACHER OR CLASS TEACHER

SCHOOL QUESTIONNAIRE

29. Provide the continuous assessment of the following subjects taught on the child. **[AVSCORE].**

English Language	**Score**	**Mathematics**	**Score**
Term 1		Term 1	
Term 2		Term 2	
Term 3		Term 3	
Mean score			

30. Estimate school attendance of child per term [this question would be obtained from school register……

31. Please tick the following school quality indicators for evaluating learning outcomes (should be answered by headteacher). Adopted from National Inspectorate Board of Ministry of Education **[EDUQTY]**

Determinants of Quality	**1**	**2**	**3**	**4**
Availability of physical structures/ conditions				
Well built school classrooms				
Recreational facilities				
Availability of waste disposal facilities				
Available of sick bay				
Availability of toilet and urinals				
Adequate Furniture				
Functional laptops/desktop				
Quality teaching/learning & standard of academic achievement				
Presence & qualification of teachers (trained/untrained)				

Presence and regularity of teachers (eg, absent on INSET/sandwich)				
Availability and use of TLMs (eg. Textbooks)				
Level of literacy and numeracy				
Repetition, promotion and transition rate as appropriate				
Class exercises, evidence of prompt marking/ learning intervention				

Key: 1: Unsatisfactory (major weakness)

2: Adequate (strengths just outweigh weakness)

3: Good (important strengths, room for improvement)

4: Very good (major strengths, minor weakness

B: MEASUREMENT OF VARIABLES

Variable	Measurement	A priori
SAGE	Over-aged (1) or otherwise (0)	
Cognitive Skills	Average test scores in Mathematics, English Language and Science	
Child Labour Hours	Number of hours worked per week	
Participation in labour	Participation (1) or otherwise (0)	
Nature of Work	Hazardous (1) or otherwise (0)	
Health Injury/Illness	Fatigue (1) or otherwise (0) Breathing Problems(1) or otherwise(0)	
Wealth proxy Index	5 Quintiles: Poorest (1), Poor (2), Middle(3), wealthy(4), wealthiest (5)	-
Parental Attitude	Index created with 8 indicators.	+/-
Father Educational Attainment	No schooling (1), Primary (2), JHS/MLSC (3).	+/-
Mother Educational Attainment	No schooling (1), Primary (2), JHS/MLSC (3)	+/-
Household Size	Number of people in each household.	+/-
Gender of Household Head	Female (1), Male (0)	+/-
Household Relation to Child	Biological (1); Foster/Maid(0)	-
Employment Status	Employed (1) or Unemployed (0)	-
Actual Age	Age in years	
School infrastructure Quality	Physical structures, teaching/learning materials, were aggregated. Additive Index created from likert scale	

Source: Akrono (2020)

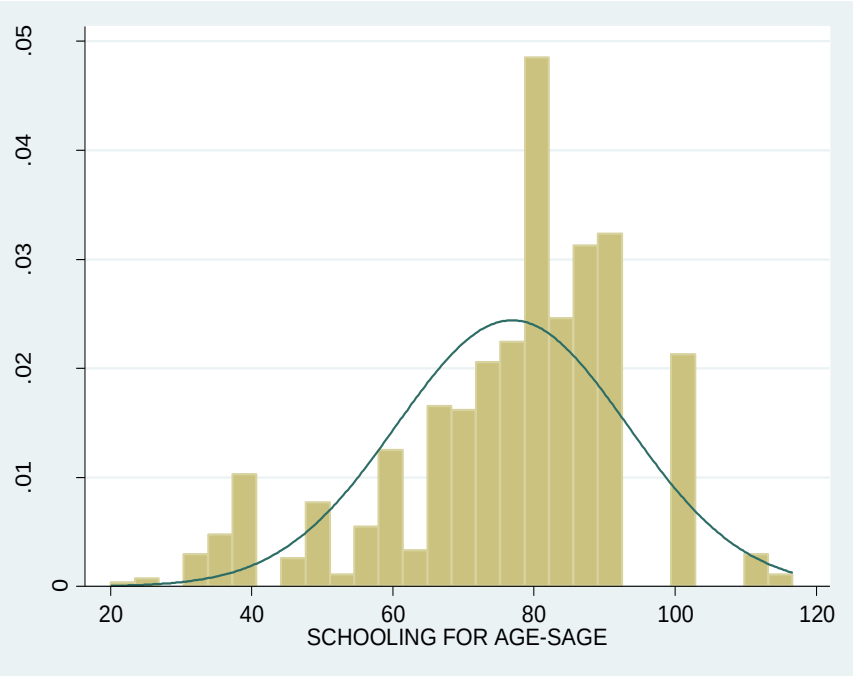
C: VARIANCE INFLATION FACTOR

Variable	VIF	1/VIF
Both Parents Attitude	1.21	0.826
Father's Attitude	1.42	0.706
Mother's Attitude	1.25	0.799
Mother Working	2.62	0.382
Father Primary Education	2.30	0.434
Father JHS Education	7.52	0.133
Mother Primary Education	5.11	0.196
Mother JHS Education	1.28	0.782
Father Occupation	1.03	0.964
Mother Occupation	1.06	0.944
Wealth quintile 2	1.95	0.512
Wealth Quintile 3	1.93	0.519
Wealth Quintile 4	1.93	0.519
School Quality	1.66	0.601
Household Relation to Child	1.07	0.935
Gender of Household Head	2.00	0.500
Sex of Child	1.99	0.503
Nature of Work	1.16	0.864
Hours of Work	1.34	0.748
Household size	2.54	0.394
Mean VIF	**2.44**	

Source: Akrono (2020)

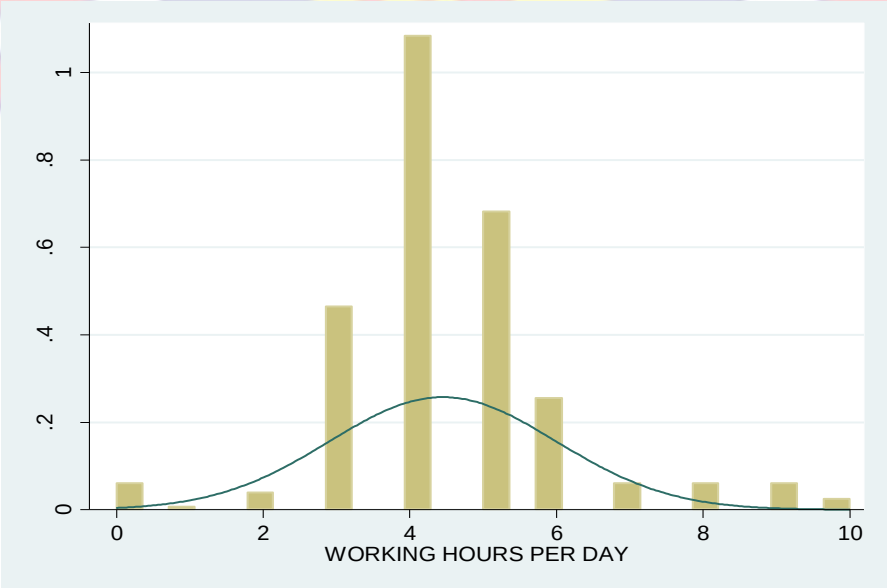
D: CHECKING FOR NORMALITY

Normality of Schooling for Age



Source: Akrono (2020)

Checking for Normality of Hours worked



Source: Akrono (2020)

E: CORRELATION MATRIX

variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fatigue	1														
breathing	.21*	1													
clpart	.09*	.01	1												
chrs	.08*	-.00	.72*	1											
activity	.05*	.00	.09*	.20*	1										
attitude	.06*	.04*	-.09*	.08*	.03*	1									
fedu	-.07*	.01	-.12*	-.08*	-.04*	.06*	1								
relation	.19*	.16*	.05*	.04*	-.03*	.01*	.00	1							
sex	-.01*	.10*	-.00	.04*	.11	.39*	.09*	-.05	1						
age	-.07*	-.11*	.18*	.25*	.14*	.09*	.01	-.00	.22*	1					
wealth	.02	.18*	-.12*	-.13*	-.08*	.14*	.11*	.24*	.03*	-.09*	1				
medu	-.13*	-.05*	-.12*	-.10*	.02*	.06*	.12*	-.08*	.05*	.04*	.06*	1			
sage	-15*	-.08*	-.27*	-.24*	-.02	.19*	.07*	-.10*	.08*	-.10*	.11*	.09*	1		
cwage	.11*	.05*	.63*	.49*	.07*	-.02*	-.08*	.10*	-.05*	.16*	-.02	-.04*	-.21*	1	
wocc	.04*	.04*	-.00	-.06*	-03*	-.07*	.01	.03*	.03*	-.10*	-.02*	.01	.00	-.00	1

***p<0.01, **p<0.005, *p<0.1

Source: Akrono (2020)

F: Validity and Reliability Assessment

Item	Results
Average inter-item covariance	0.0766151
Number of items in the scale	8
Scale reliability coefficient	0.7287

Source: Akrono (2020)

G: Probit Regression: Intensity of Child Labour on SAGE

	Probit	IVprobit
Variable	**AME**	**AME**
Child labour Hours	0.010***	0.031***
	(0.002)	(0.006)
Mother Characteristics		
Employment status *(unemployed)*		
Employed	-0.065**	0.030**
	(0.089)	(0.076)
Educational level *(no. edu)*		
Primary Education	-0.122	-0.105
	(0.100)	(0.086)
JHS/MLSC	-0.167	-0.227
	(0.115)	(0.098)
Father Characteristics		
Employment status *(unemployed)*		
Employed	0.041**	0.053**
	(0.028)	(0.028)
Educational level *(no.educ)*		
Primary Education	-0.051	-0.032
	(0.063)	(0.093)
JHS/MLSC	-0.161	-0.038
	(0.064)	(0.063)
Household Characteristics		
Household Wealth-*1st Quintile*		
2nd Quintile	-0.007**	-0.030
	(0.034)	(0.042)
3rd Quintile	-0.044**	-0.012
	(0.037)	(0.043)
4th Quintile	-0.119**	-0.081**
	(0.041)	(0.046)
5th Quintile	-0.135**	-0.097**
	(0.043)	(0.048)
Household size	-0.052	-0.067
	(0.033)	(0.031)
School Quality	0.208	0.180
	(0.121)	(0.121)
Model specification test-hatsq		0.026
		(0.006)
VIF	2.24	2.77
Observation	786	786

Source: Akrono (2020) ***p<0.01 **p<0.05 *p<0.1